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The
Arctic Expedition
1910

Department of Marine
and Fisheries

Canada. Dept. of marine and fisheries

REPORT

on the

Dominion Government Expedition

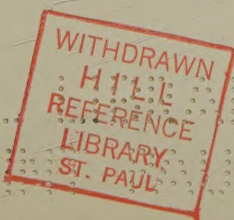
to

THE NORTHERN WATERS AND ARCTIC ARCHIPELAGO

of the

D.G.S. "Arctic" in 1910.

UNDER COMMAND OF J. E. BERNIER,
Officer in Charge and Fishery Officer.



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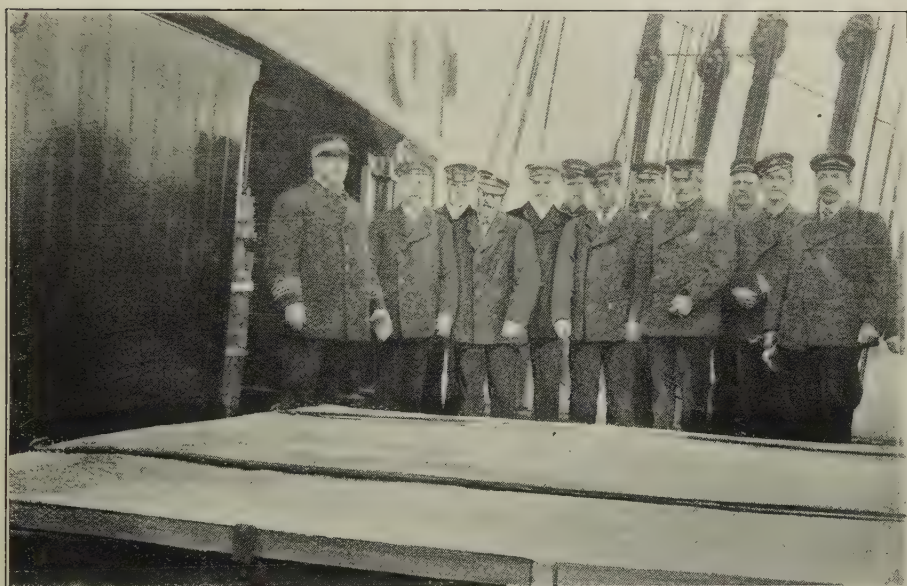
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Group of officers and men on "Arctic," July 10th, 1910.

TO THE HON. JOHN DOUGLAS HAZEN,
Minister of Marine and Fisheries
Ottawa.

Sir,

I have the honour to submit the report of the Expedition of the Dominion Government steamer "Arctic," in 1910-11, under command of Captain J. E. Bernier, to the Northern waters and Arctic Archipelago, for the intended purpose of making the Northwest passage and for patrolling waters where whaling is prosecuted.

This report is supplementary to the report of the Expedition made by the same steamer under the same Commander in 1908-9, as the voyage made was practically in the same waters.

The report has been compiled by Mr. W. W. Stumbles and staff of this department from extracts of the log of the "Arctic," and reports of officers of the ship, submitted by Captain Bernier.

I have the honour to be, sir,

Your obedient servant,

ALEXANDER JOHNSTON,
Deputy Minister of Marine and Fisheries.

Department of Marine and Fisheries,
Ottawa.

Ottawa, 5th July, 1910.

INSTRUCTIONS TO CAPTAIN J. E. BERNIER.

Sir,—

Your instructions for the cruise of the S.S. "Arctic" in the northern waters of Canada, which you are about to make, are as follows:—

(1) As soon as practicable after receiving these instructions you will leave Quebec for the waters which you are to patrol, calling at Chateau bay for final orders, if any, from the Department. On reaching Chateau bay you will communicate with the Department.

(2) It will be your duty to patrol Davis strait, Baffin bay, Lancaster sound, Barrow strait, Melville sound, McClure strait, and Beaufort sea to Herschel island, thence through Behring strait to Vancouver or Victoria, B.C. The advisability of attempting to make the northwest passage is, however, left to your judgment after ascertaining the ice conditions on the spot. If you are satisfied that the passage cannot be attempted without imminent danger to the ship and her officers and crew you will return to Quebec at the conclusion of your work in the other waters above referred to. It is not desirable that the present expedition should extend over two years from this July.

(3) You will acquaint any persons whom you may find engaged in the whale fishery in these northern waters that you are patrolling these waters as the duly accredited officer of the Canadian Government, and you will, where necessary, demand payment of license fees for such fishing. If payment be refused you will make a request that such refusal be put in writing. It is not desirable that you should take any action in this regard which would be likely to embarrass the Government.

(4) The instructions you have received on former cruises in these northern waters as to the reports and advices to be sent to the Department, both before sailing from Quebec and afterwards, are to be considered as applicable to this expedition.

(5) Before leaving Quebec you will send a complete list of everybody on board the "Arctic" who is to accompany you.

On behalf of the Minister and the Department I wish you all a prosperous voyage and a safe return.

(Sgd.) A. JOHNSTON,
Deputy Minister of Marine and Fisheries.

Captain J. E. Bernier,
S.S. "Arctic,"
Quebec.

SHIP'S COMPANY.

OFFICERS.

CAPTAIN J. E. BERNIER	.	.	.	Commander
O. J. MORIN	.	.	.	First Officer
ROBERT S. JANES	.	.	.	Second Officer
EDWARD MACDONALD	.	.	.	Third Officer
JOHN V. KOENIG	.	.	.	Chief Engineer
EMILE BOLDUC	.	.	.	Second Engineer
JOSEPH THIBAUD	.	.	.	Purser and Steward

SCIENTIFIC STAFF.

JOSEPH ETIENNE BOLDUC	.	.	.	Medical Officer
FABIEN VANASSE	.	.	.	Historiographer
J. T. E. LAVOIE	.	.	.	Meteorologist and Geologist
ARTHUR ENGLISH	.	.	.	Prospector and Taxidermist

CREW.

JOSEPH LESSARD	.	.	.	Quarter Master
ALPHÉ BOUCHARD	.	.	.	" "
WILLIAM LABELLE	.	.	.	" "
JOSEPH EUGENE MATHÉ	.	.	.	Ass't Steward
PHILLIP C. F. REYNOLDS	.	.	.	Cook
LOUIS BEAULIEU	.	.	.	Second Cook
PAUL MERCIER	.	.	.	Oiler
AURELIEN LEGENDRE	.	.	.	"
ALBERT NOLET	.	.	.	"
AUGUSTE VEZINA	.	.	.	"
NAPOLÉON NORMAND	.	.	.	Carpenter
NAPOLÉON CHASSÉ	.	.	.	Boatsman
BENOID CHARTRAND	.	.	.	Waiter and Portager
PAUL TREMBLAY	.	.	.	Waiter
GEORGE GOSSELIN	.	.	.	Laundryman
THOMAS HOLDEN	.	.	.	Boatswain
WILFRED C. CARON	.	.	.	Able B.S.
LOUIS BERNIER	.	.	.	"
EUGENE MONTFORT	.	.	.	"
WILLIAM MORIN	.	.	.	"
WILLIAM DOYLE	.	.	.	"
AUGUSTE MICHEL	.	.	.	"
ALFRED TREMBLAY	.	.	.	"
JAMES BRACE	.	.	.	
NAPOLEON GARANT	.	.	.	Fireman

THE CRUISE OF THE "ARCTIC" TO NORTHERN WATERS, 1910-1911.



UNDER authority of a Royal Commission, issued July 23rd, 1906, Captain Joseph Elzear Bernier was appointed to take charge of the Canadian Government steamer "Arctic," in an exploring expedition to Hudson Bay and Northern Waters, belonging to Canada and to patrol these waters as a Fishery officer. The "Arctic" was fitted out and sailing instructions given by direction of the Hon. L. P. Brodeur, Minister of Marine and Fisheries. The "Arctic" returned the same year. Another expedition by the same steamer, under command of the same officer and under the same authority, was fitted out in 1908 with instructions to explore the Arctic Archipelago and waters to the extreme far north and west as far as Melville island. The voyage was completed in October, 1909, by a return to Quebec, and a full report was made by Captain Bernier to the Minister of Marine and Fisheries and published in the early part of 1910.

In 1910 the "Arctic" was again fitted out and instructions given under the direction of the same Minister of Marine and Fisheries by the Deputy Minister, published in this report. The instructions, as it will be seen by reference to them, included directions to make the North West passage, if possible, by McClure strait and Beaufort sea and to patrol the Canadian waters of the Arctic ocean in the fishery interest and to continue the voyage through Behring sea and strait to Victoria, British Columbia.

The "Arctic" was unable to proceed in 1910 farther than the west coast of Melville island owing to the extremely heavy bodies of ice which filled the western entrance of McClure strait. The vessel returned eastward and entered Admiralty inlet, sailed southward as far as possible and afterwards made her winter quarters in Arctic bay on the east side of Admiralty inlet. Explorations were made along the shores of the inlet by several officers and parties sent from the ship during the winter, and an extended trip overland was undertaken to Fury and Hecla strait, south of Cockburn land and to the shores of the eastern part of the Gulf of Boothia by a survey party, in December 1910.

In the journey dogs were used and Eskimo guides employed. The officer in charge of the survey was accompanied by an officer instructed to observe the geological formation of the country traversed, to collect mineral specimens if discovered and note carefully the localities. Instruments were employed to determine the latitude, longitude and temperature of different places, and thickness of ice along the shores of the waters visited. Another survey party under the same officer was sent from the ship, in March, 1911, with instructions from Captain Bernier to cross Admiralty inlet to the west side and overland to Prince Regent inlet, west of Admiralty inlet, and to survey the east side of Prince Regent inlet southward to cape Kater, proceeding still further south and eastward to cape Hallowell in the

strait of Fury and Hecla. Eskimo guides and dogs were also used in this trip; necessary instruments were employed for triangulation on the coast of Prince Regent strait. An island was mapped, situated in the Gulf of Boothia. Geological, mineralogical, meteorological and other observations were made.

Observing parties for different purposes, mainly mineral observations, were sent out during the spring months, and on the return voyage from Arctic bay in August, 1911, surveys were made in Milne inlet, Eclipse sound, Ponds inlet and the northern part of Baffin land.

Reports of the officers engaged in the work mentioned were handed in to the Department, and they are published in an abridged form as appendices to the main report.

The report has been carefully compiled from notes selected by Captain Bernier from his log book. These notes, with a large number of photographs, some maps, and a meteorological report made by Mr. Lavoie, the officer in charge of the surveys, and all the reports were duly submitted, accompanied by letter to the Deputy Minister as the report upon the expedition.

The mineral specimens, rock and coal collected, during the voyage, were delivered to the Mines Department in Ottawa and a report upon the result of the analysis is herewith published as an appendix.

The geological observations are brief but the report of Prof. A. P. Low, former Director of the Geological Surveys of the Dominion, to the Minister of Marine and Fisheries, made in 1903-1904, of the "Cruise of the Neptune," in which he was the geologist and officer in command, in a voyage to Hudson bay and Arctic islands, contains more definite and scientific information. The report of J. G. McMillan, geologist in the expedition of the "Arctic" in 1908-1909 to the Arctic Archipelago, is also very full, including Baffin land.

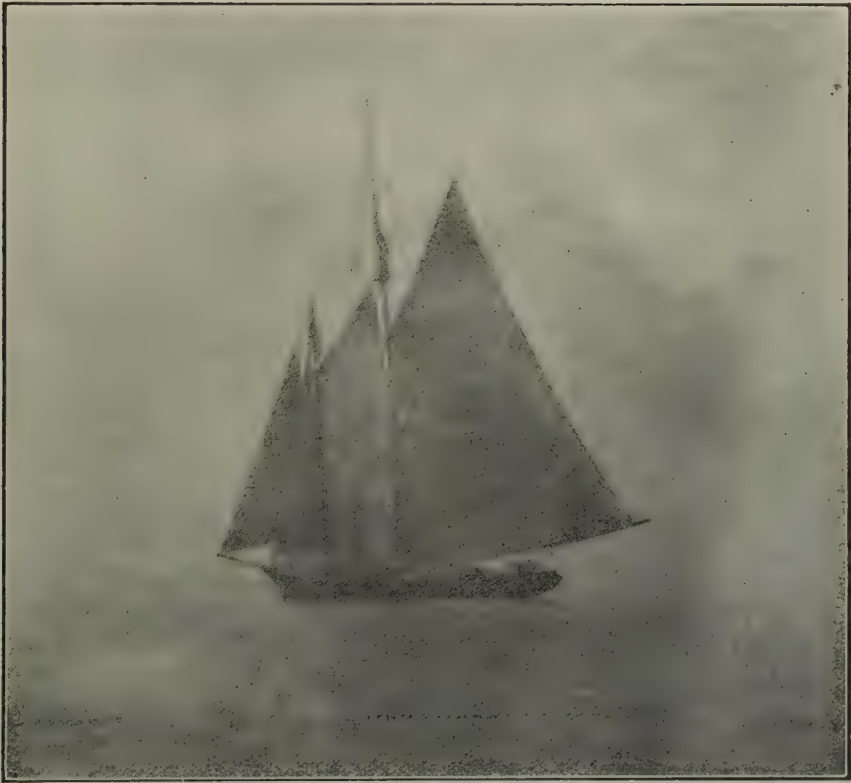
The observations made in May had in view the possible return of the "Arctic" by Fox channel, Hudson bay and strait to Quebec, but the ice during the winter of 1910-11 had formed in such masses in the gulf of Boothia, Fury and Hecla strait and Fox channel, that no prospect of getting through safely could be seen.

This report is supplementary to the report of the voyage of 1908-1909. Although the intention was to make the "North-west Passage," the waters patrolled and the service performed, were practically the same as in the former voyage. New conditions with regard to ice formation and blocking of channels comparatively free in 1908-1909, presented difficulties in navigation in 1910 that were not experienced in other voyages, but, on the other hand, the winter quarters in Arctic bay were more satisfactory, being far less exposed to high winds, and the weather as a general thing more moderate. During the long period of daylight more extensive excursions overland were possible than in the former voyage. Dogs were available, obtained from the Eskimos in the vicinity of Arctic bay, and some of the natives acted as guides to distant points. No Eskimo tribes inhabit Melville island where the vessel wintered in 1908-1909, therefore, explorations were not made inland to any considerable distance or remote parts of the island. The longest journies were undertaken to Banks island and Victoria island across McClure strait by officers of the ship who travelled on foot and drew their supplies and outfit on sleds. The last expedition of the "Arctic" differed in this respect from the former, and a more thorough search was made for minerals, to occupy the time of the officers and crew.

The "Arctic" was fitted out and provisioned for a voyage of two years, at Quebec. Some incidents in connection with the departure of the vessel are here related as matters of interest attached to an expedition setting out upon a long voyage to the distant northern waters. The Minister of Marine and Fisheries, the Hon. L. P. Brodeur, who intended to see the vessel off, was unable to go to Quebec, owing to other official duties. The Hon. Joseph E. Caron, Minister of Agriculture of the province of Quebec, on behalf of the Minister of Marine and Fisheries, wished the Commander and crew a successful voyage and safe return. Flags from vessels in the harbour were hoisted in honour of the event and steam

whistles saluted the "Arctic" as she started from the wharf and sailed along the harbour. These salutes were returned by the outgoing ship, which had her principal flags flying. The "Arctic" was deeply laden with provisions and coal, had on board, including the Commander and Officers, a crew of 36 all told. Accompanying the ship for a short distance the Dominion Government steamer carried a number of officials from the Marine and Fisheries agency and other Government officials, both Federal and Provincial. The "Arctic" was piloted by Arthur Koenig, the date of leaving the 7th of July, 1910, with favourable weather. A west wind enabled the vessel to hoist her square sails and with auxiliary steam power, she passed down the St. Lawrence river.

Between Quebec and Father point an inspection was made of the crew by Dr. Bolduc, the ship's doctor, and at 5 p.m., the second day out, the vessel arrived at Father point for final orders from Ottawa, and took on board some stores which had not been shipped at Quebec. From Father point, the "Arctic" proceeded, on the 8th of July, towards point des Mont; she arrived off the point on the 9th. Sunday, the 10th, was fine; new suits of blue cloth were issued to the men and a religious service was held on deck. The weather continued fine after the gulf of St. Lawrence had been entered, but heavy flashes of lightning on Sunday night, indicated some atmospheric disturbance at no great distance. No change of moment occurred in the course along Anticosti island, from which place the course was shaped to point Rich. Observations could not be taken on the 11th, at mid-day, as the sun could not be seen. The vessel, although deeply laden, had acted well and made good progress. Before passing through the strait of Belle isle the crew was set at the work of lashing the deck load, in readiness for sea.



The "Grayling" looking for two of her men lost in the fog, Labrador Coast, July 15th, 1910.



"Arctic" stopped by the Ice, opposite Uppernavik, July, 1910.

Tuesday, the 12th, being clear, the coast of Newfoundland was sighted, and the vessel, making good headway, reached the coast. Point Rich was passed and a landing made at point Amour, where the mail from the ship was left to be forwarded to Ottawa and other points. This place was left at 1.30 a.m. on the 13th of July, the vessel proceeding through the strait of Belle Isle under sail and steam. Quite a large number of schooners were met on their way eastward. So

far no important change in the wind or weather had occurred, but so far nothing eventful had transpired nor of a nature deserving special mention excepting, the fact that a large number of fishing schooners were seen in the strait, differing very little from one another in appearance, the men engaged in their occupation or the vessels underway passing westward.

The crew of the "Arctic" had in the passage to the strait been assigned their various duties in managing the ship, and each officer on active duty, took his regular watch. Most of the men were on a voyage of this kind for the first time and consequently, needed orders of instruction from the experienced officers who had been previously to sea in the "Arctic," until they had become accustomed to the ship, while the discipline peculiar to Government ships on Arctic expeditions, was being enforced upon all on board.

In navigating the ship the usual landmarks and aids to navigation were clearly observed, but after passing Double island on the 13th, the wind changed from N.E. to S.E. and caused a heavy easterly swell, accompanied by thick fog. The position of the ship, by account, was in latitude 53 03 N. and longitude 55 18 W. The fore and aft sails were set and coal was taken from the forehold to keep the vessel in proper trim. The wind changed to the N.E. and became very fresh, causing the "Arctic" to roll considerably. At daylight on Friday, the 15th July, the first iceberg was sighted; the wind hauled to the N.N.W. and the sails were again set. Coming towards us a fishing schooner, named the "Grayling," reported that she had lost two men in a dory. One of the crew of the "Arctic" was sent aloft to the crow's nest to look for any sign of the men, and this search was continued for a few hours, without success, until fog set in and the lookout was prevented from seeing any distance, making it useless to keep up the search. On the 16th the weather was fine, and the wind changing from the W.N.W. to E.S.E then E. all sails were set to advantage, but a heavy roll continued. As the sun did not appear, no observations were possible. By account the vessel was in latitude 56 48 N. and longitude 54 01 W. Head winds set in at this time and made it necessary to clew up the sails and the vessel proceeded under steam at a rather slow rate. On the 17th, observations were taken at noon, and the clocks were adjusted. The latitude by observation was 58 17 N., longitude W. 54 00. The weather was heavy at times and some small icebergs were passed.

The vessel was now approaching the Arctic circle; the lights were put out at 2 a.m. on the 18th of July. In the early part of the forenoon, a two-masted steamer, believed to be Danish, was passed. At noon of the 19th the latitude, by observation, was 62 22 N., longitude 53 46 W.; the high peaks of Greenland came in view and the "Arctic" had entered the region of perpetual daylight during the 24 hours. Not much ice was seen on the 20th; the coast of Greenland was still in view, the clear weather enabling the crew to see well around the horizon; about 30 whales sporting in the waters were observed at a distance of five miles or so away. At about 25 miles from Greenland, in latitude 66 44 N. longitude 54 30 W., a fine view of the land was obtained, but on the 21st fog set in; all square sails were set and shortly after, the fog clearing, the entrance of Holsteinborg was in view. The summits of the hills were covered with snow and presented a fine panorama, photographs of which were taken. At this time favourable winds and weather enabled the vessel to make fair progress; but the coal in the bunkers was getting low and the men were set at work to refill the bunkers from the main hold. At noon of the 22nd, in latitude 69 10 N., longitude 54 45 W., Disko island was seen; a strong wind from the N.W. by W. soon made it necessary to clew up the sails. At 10 p.m. light fog set in but it was clear enough to notice a few icebergs here and there. The wind changed on the following day, the 23rd, to the S.W. when all sail was set, causing the ship to make good way to clear a large iceberg. Having made some progress, Hare island north of Disko island, hove in view, the latitude being 70 11 N., longitude 50 40 W. As fog and rain had set in and icebergs were numerous, the course was shaped more to the west to clear the bergs. Great care was necessary, and

constant watchfulness compelled the captain and sailors to be on the alert to prevent disaster. Fine weather and but few icebergs on Sunday, the 24th, brought rest and it was made a veritable day of rest.



Icefloe, Baffin Bay, July 23rd, 1910.

Monday, however, changed the scene and with it came vast fields of ice that surrounded the vessel leaving no leads, and this condition of the ice was somewhat aggravated by the danger from large icebergs moving south. Several large icebergs surrounded by field ice were passing along the coast of Greenland, increasing the difficulties of navigation, but leads were found through which the vessel worked her way slowly until Devils tongue, Greenland, was sighted; latitude of the vessel at the time, 70 01 N. longitude 59 41 W. Five bears were seen at this time and an exceptionally large iceberg. For several days the vessel had been beset by ice, but more favourable conditions now enabled progress to be made by the parting of the fields in several directions. The course taken was to the northeastward and at midnight the land, bearing S.E., was observed, about 45 miles distant. On the 27th fog and rain set in. The vessel had been running at full speed all night, the captain remaining on deck to direct the course through the leads that had opened in the direction which the vessel was sailing. No icebergs were in sight at the time and the ice was becoming very much decayed and looser.

At 9 p.m. on the 27th cape George was sighted N. by W. true, about 40 miles off, but at midnight the vessel had to stop way owing to the fog. It did not continue for any length of time and the vessel was started ahead on the morning of the 28th at 4. At noon the sun shone out, the position of the ship by observation was in latitude 75 03 N. longitude 69 58 W.; the course steered varied from W. N. W. to N., the weather was fine and clear with no wind, permitting the ship to make good headway. Opposite cape York were seen vast numbers of the little Auk. Preparations were, at this time, being made to land stores; the weather, however, changed and became foggy. No ice interfered with the vessel's progress and all sails were

set in a favourable wind, to save coal. The wind died away and the engines were started; at 10 p.m. Button point, Bylot island, was passed, the vessel was steered towards Ponds bay and at 2 a.m. on the 30th July she arrived at a point named George V. Mountain. The ice at this point was still unbroken but covered with water. At noon of the same day, the first officer and three men with a sleigh and boat were sent to Albert harbour.

Owing to the ice which blocked the way, very little progress was made and the vessel was made fast to the ice as no water was to be seen to the westward.



"Arctic" in ice, Smith Sound, July 24th, 1910.



Ponds Inlet, "Arctic" moored to Icefloe, July 31st, 1910.



Peak King George V, Ponds Inlet, August 1st, 1910.



Northern Flowers, Ponds Inlet, July 31st, 1910.

CHAPTER II.

The chief officer returned to the vessel bringing with him 5 Eskimos from the whaling stations. These men reported that the captain of the whaler "Morning" had arrived at the station, and had left. It was learned also that captain Milne, of the "Diana," had landed on the outer pack and had departed, intending to return. On Monday, the first of August, the "Arctic" got underway, making only one mile. From this point the second officer, two men and three Eskimos were sent to Salmon river to catch fish, for use on board. The ice began to show signs of moving on the 2nd of August, and as a precautionary step a dock was cut in the ice to prevent the moving ice from squeezing the ship. On the 3rd the lines were cast off and the vessel proceeded towards the harbour, which had been cleared by strong winds from the south. The harbour was entered but great exertions had been necessary to make this haven. The anchor was dropped in 20 fathoms, on the 4th of August; the men were immediately set at work to land lumber for building a small house to store three months' provisions, on the west side of the northern entrance of the harbour.

The work of building was completed in three days, provisions were stored in view of any accident to the "Arctic" that might make it necessary to return to this point. Sailing in these northern waters is uncertain and experience has taught those in command of northern expeditions that it is wise to provide against possible loss of a ship with a number of souls on board, particularly men who are not accustomed to securing food in the precarious way of the native or experienced explorers in those regions. An iceboat was also left as another precautionary measure.



"Arctic" Sailors, July 10th, 1910.

Observations of the sun were made, to ascertain the magnetic variation from the true north. The magnetic pole being south and west of Albert harbour this step was necessary for compass steering. Unfortunately the harbour was again filled by the ice which moved backwards and forwards with the tide and changing winds. Usually the heavy field ice clears from the vicinity of Albert harbour and Ponds' inlet at an earlier period. The late season caused disappointment and did not augur



On top of King George V. Mountain, 1800 feet in height. Ship in the Bay.

well for easy advance through Lancaster sound. In the meantime, the launch was got ready on the 6th of August and sent to Salmon river to bring the men who had been sent there to the ship. They were successful in securing salmon and brought 490 that were immediately salted for future use on board.



Beloeil Island, bearing west, August 1st, 1910.

On Sunday the 7th the men were all allowed to go on shore as the harbour remained full of ice. The next day an attempt was made by the first officer to go to Salmon river for more fish, but this effort was unsuccessful owing to strong winds and large fields of ice which blocked the way. During the stay at Albert harbour a census of the natives was taken by Mr. Vanasse the historiographer, and Mr. Lavoie, who was acting as Customs Officer, went on board the "Diana" of Newfoundland to ascertain if dutiable goods were brought to the whaling station. Fresh water was put in the tank and on the 10th the second officer and some men were sent to a small river about 4 miles from the cache to fish, returning at night with about 2,000 pounds of fine salmon trout, which were cleaned and in due course dried.

Purchase was made of 38 Eskimo dogs at the village of Albert and they were taken on board; on the 12th, two Eskimos were hired, one named Macatowee, the other Macashaw. The vessel was moved towards the river where the salmon trout had been taken and on the way a boat approached which proved to be from the "Diana"; the "Arctic" returned to Albert harbour and Captain Bernier went on board the "Diana" to collect the fishery license fee from Captain Milne. Mr. Lavoie, acting Customs Officer, went on board the "Diana" to ascertain if there were dutiable goods on board, but as the vessel had nothing but her own stores returned to the "Arctic." Letters were delivered to Captain Milne on the 13th to be forwarded to Ottawa.

Having attended to all matters that required attention at Albert harbour and the ice conditions becoming more favourable the harbour was left on the



Bylot Island, August 1st, 1910.

13th and the vessel proceeded to pass around the eastern side of Bylot island for the purpose of entering Lancaster sound. The wind was S.W.; fog interfered to some extent with making headway; it was possible, however, to steer close to land. Guys bight was passed and on the 14th, Button point and cape Graham Moore. Some surveys were made along the coast and bays entered. Bathurst bay north of cape Walter-Bathurst is a fine bay affording shelter in a northerly wind and another bay to the north of this can be used to advantage in a southerly wind. Outside cape Byam-Martin is a rock about a third of a mile off shore and awash at half tide; this rock is dangerous when keeping along the land. The "Arctic" sailed along shore until Possession bay was reached where the Captain landed, taking with him several men in order to deposit records and search for records left by Sir John Ross. The papers from the "Arctic" were deposited on the highest peak of the hills surrounding the bay, the peak is about 900 feet above sea level.

Returning from this cache, Captain Bernier found on the bank of a small river an old cairn broken up; a stove bearing date of 1848 was found, strewn about were some broken bottles. Two men had been sent to a hill east of the one at which the deposit of the "Arctic" records had been made, where a cairn was found which the men took apart but no record was found, it had been removed; the cairn was partly rebuilt and all returned on board. On Monday the 15th the voyage was resumed towards the entrance of Lancaster sound. This body of water, it is well known by explorers, was discovered by Commander William Parry in 1819 and is the way to the North West Passage of so much historical interest, in deep water. Hope monument on North Devon was made on the 15th of August and the course was shaped to cape Wanderer on the same coast; Crokers bay which runs well in was crossed; no ice was visible excepting some small icebergs, scattered here and there. Shortly after Dundas harbour was passed; at this point a photo-

graph was taken but the harbour was not entered. Here began some difficult navigation owing to field ice, danger was imminent and it was necessary to stop and study the ice conditions. While thus engaged the field ice kept pressing the vessel into close quarters. At this time a bear on the ice was shot and secured.

No water could be seen except to the south, and deeming it possible to make for the open water the vessel, which had been moored to the ice pressing on the coast, was again put underway. On the 17th the opening enabled the "Arctic" to get clear of her dangerous position, although with difficulty; a passage sufficient to permit the vessel to make clear water was steamed through. The wind from the W.S.W. rose, bringing with it rain. Fog now rested on the ice which again pressed the ship on every side, compelling her for safety to stop. But the time



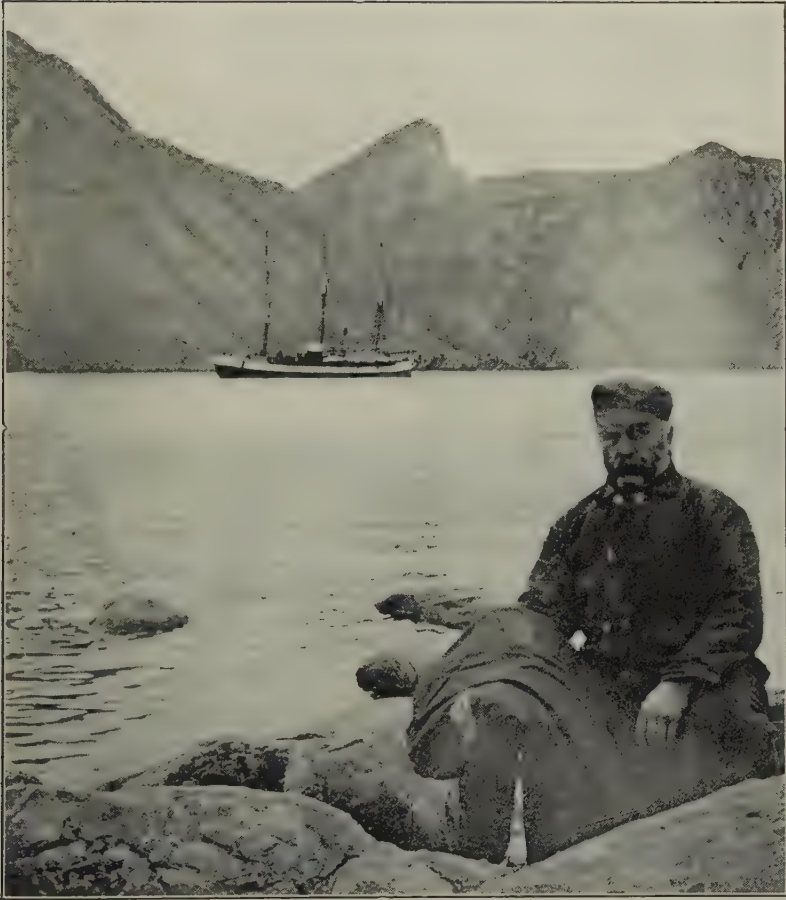
Training a Lost Dog, Ponds Inlet, August 1st, 1910.

was made the most of by filling the fresh water tanks from the fresh water obtainable on the ice. On the 18th some clear water was observable near the land, the vessel proceeded towards Erebus bay; at noon cape Herbo was passed, Leopold island sighted and Erebus bay was entered not long afterwards.

The bay was full of ice at the time but narrow leads were taken advantage of to pass close to cape Riley which showed more water in its vicinity than other parts and here the anchor was dropped. Stores were landed to add to the provisions left on the previous voyage. This of course was done in case of an accident further west. Prudence dictated this step on account of the evidence, thus far, observed of the extremely backward state of ice movements in the region. During the former voyage few of the obstacles presented themselves, that had so far on this voyage been met since leaving the coast of Greenland.



Albert Harbour, Cache No. 1, August 11th, 1910.



Albert Harbour, Carpenter P. Norman, August, 1910.



First Polar Bear captured, North Devon, August 17th, 1910.



Cape Riley, North Devon, August 18th, 1910.

In order to protect the stores landed a small building was put up by the carpenter; while this work was proceeding steps were taken to ascertain, if possible, the ice movements outside the bay. The second officer was sent to Beechy island to look for open water in Wellington channel, at the same time he had instructions to search for records left by Sir John Ross in a cairn on the island. The officer was successful in his search but another cairn examined by Captain Bernier contained nothing in the line of records. The following is a correct copy of the records left by Sir John Ross:—

These are to certify the Yacht “Mary” has been left hauled up above high water mark as a vessel of refuge for the crews of vessels who are or may be wrecked within reach of cape Spencer and Beechy island, at the request of the Captains and Commanders of British and American vessels named on the margin, to which I have consented, the “Mary” being my property, and that this cairn is built to denote her position on the nearest part of the Beach.

Resolute.
Pioneer (s).
n. s. Advance.
d. Rescue.
Lady Franklin.
Sophia.

Given under my hand on board the
Felix Discovery vessel this 6th Sept.,
1850.

(Signed) John Ross,
Captain Royal Navy.

Beechy Island,
Cairn built,
7th September, 1850.

ACCOUNT OF PROVISIONS.

Felix. The Yacht "Mary" of 12 tons, completely fitted with masts, sails, rigging, cooking utensils, one cask flour and coals.
 Resolute. 3 casks of flour, 60 lbs. preserved meat, 28 lbs. tea, one bale blankets.
 Advance. 1 cask beef, 1 cask pork.
 Lady Franklin.—1 cask beef, 1 cask pork, 1 bag of pease.

Captain Edward Belcher, H.M.S. "Assistance,"

" H. Kellett " "Resolute,"

Visited this cairn this 12th August, 1852.

North Star Depot at Beechy Id.

Assistance and Pioneer going up Wellington Channel.

Resolute and Intrepid—Melville Id.

(Initialled) E. B.

It is a well known historical fact in the search for Sir John Franklin, that Commander E. Belcher was in command of an expedition consisting of five vessels, and the note at the bottom of the letter is therefore a certificate confirming the action of Sir John Ross.

From Erebus bay the voyage was resumed but so much ice, in large fields, hindered her progress that navigation across Wellington channel, between North Devon and Cornwallis island, was exceedingly difficult. Fortunately the weather was calm, enabling the vessel when stopped, to make fast to the ice. Cape Hotham, on Cornwallis island, was then about 15 miles away and on resuming, leads of all kinds and in all directions were opened by the wind from the north and at 6 p.m., of the 20th of August, the "Arctic" was close to the cape, working westerly. Shortly after this the ship was made fast to ice off the cape. Several attempts were made



Sir John Ross' Cairn, found on Cape Spencer, August 19th, 1910.



Finding Sir John Ross' Record, Cape Spencer, Aug. 19th, 1910.

to make progress but with very little success as the vessel was completely beset. The wind, however, made some changes in the ice movements and open leads permitted the vessel to coast along the land of Cornwallis island, in from 9 to 15 fathoms of water until she arrived off Resolute bay, on the south western end of Cornwallis island.

It was now the 22nd of August, showing that the progress to the west was not as rapid as desired, although no accident to the ship had occurred and strenuous efforts had been made. It has already been stated that the ice was later than usual in moving through the strait and the prospect at this point was far from being as bright as on the previous voyage to Winter harbour, on Melville island.

On the 23rd of August, while attempting to get through a large pan of ice, a bear was noticed within rifle range and was shot. Part of the carcass was found fairly palatable by the men, but portions were fed to the dogs on board. The ship being unable to get through the pan of ice the course was changed to work around it and the attempt was successful. At this stage of the voyage boots and stockings of a suitable kind were issued to the crew, and some other stores, principally tobacco. On this day Sherringham point, Cornwallis island, was passed.

Conditions, instead of becoming better, grew worse, the ice pressing on the coast made it somewhat dangerous and the position had to be changed but the vessel failed to make any distance for some hours. On the 24th at 2 p.m. she cleared the ice pressure through some leads and passed Intrepid harbour. This harbour is considered good for anchorage and shelter but as there was no reason for entering it the vessel proceeded to cross Macdougald bay, to find a channel towards Bathurst island.

Progress, however, was impeded by heavy ice and the vessel was made fast to the ice at Rosse point on the southwestern side of Cornwallis island. The cast of the lead showed 133 fathoms of water. On Thursday, the 25th of August, the ship got clear of the heavy ice and made for Pioneer bay, Cornwallis island, and in the forenoon dropped anchor under point Airy at the entrance of Pioneer bay.

Here a boat was launched and the Commander went ashore to deposit some records. A cairn was erected about 60 feet above sea level and the papers placed there containing information concerning the visit of the "Arctic."

While here, Captain Bernier and the men who accompanied him, explored part of Cornwallis island in the immediate vicinity of Pioneer bay. As a result of this study of the physical features a natural harbour and a large and deep lake, with smaller lakes, were discovered. It was assumed by the Captain that these lakes had been part of the inner section of the bay, but no reasons are assigned for the change in the topography of the country, and therefore, the statement is made upon the belief of the explorers who evidently had some good grounds for supporting their opinions.

So far, the movements of the vessel and ice difficulties encountered, have been mentioned, but no reference has been made to the topography of the country passed or of the distinctive features of the waters, currents, different ice formations, nor of the effect of winds in driving the ice on the coasts, and of checking it in its progress west and south and to the more open bodies of water and finally into the Atlantic ocean. The ice descends in its flow from the channels north of Lancaster sound, Barrow and McClure straits, and from Beaufort sea and the Arctic ocean at the western end of McClure strait. Part of it finds its way by tidal currents from bays and inlets on the southern side of the waters named, by the influence of the tide which has a general trend eastward.

The main purpose of the report, so far, has been to show the daily movements of the vessel and to mention the points in geographical succession where landings had been made, or where the land had been approached.

With the exception of Albert harbour, Ponds inlet, the absence of natives is remarkable. It may appear singular to the reader unacquainted with the history of explorations of the Arctic Archipelago that no mention is made of Eskimo settlements. All the explorers of the islands along which the "Arctic" sailed, from Parry in 1819 down to the present, noted the absence of native settlements along the northern side of Lancaster sound and other waters, to Melville island and Prince Patrick island on the extreme west. Discoveries of native occupation in the remote past have been made and some evidences of occasional visits by Eskimos exist, but no proof of continuous habitation nor periodical migratory movements has been established. The country, or more definitely speaking, the islands form a great lone land so far as human habitation is concerned. Whalers may have followed their occupation in the waters but no traces lead to the conclusion of recent landing on the shores.

Numerous monuments of exploration from the time of Sir John Franklin are there. The intrepid men of the British navy and those searchers for Franklin from Britain and other nations who volunteered their services, have left their tokens in many harbours and bays along the coasts. Cairns, caches and old stations stand to-day as silent proofs of the heroism and hardships of the enthusiastic discoverers. Their tale has been told, and if no reports were in the Archives of the British Admiralty nor printed volumes extant, the history is graphically portrayed by the monuments the early navigators left behind them. One of the best known places is Erebus bay, where Franklin buried three of his men, another is Beechy island where Sir John Ross left the record printed in this report. Other stations established by the commanders sent to search for Sir John Franklin and by Commander Sir W. E. Parry, the discoverer of the Arctic Archipelago, will be mentioned as this voyage is further described.

On the 25th of August the ship cleared from the coast of Pioneer bay and at 8 p.m. she was off Baker island; ice difficulties caused the vessel to make fast to the ice to enable her to hold the distance on this coast that had been made. Upon the loosening of the ice the vessel was again started and the south end of Moore island was passed in 13 fathoms of water.

The compasses now became useless, the needle of one pointed E.N.E. and the

other W. by N., due to magnetic disturbances. The wind being off shore the fore and aft sails were set and the vessel was steered by the land. In passing Moore island it was noticed that the coast on the east side was intensely black, no doubt, showing signs of coal deposits. Ackland bay, at the south end of Bathurst island, was approached about 6 miles off shore in order to avoid a shoal patch ; soon cape Cockburn was reached bearing N.W. 4 miles off and a course towards Byam-Martin island was steered. The variations of the compasses at this time was 170° W., they were therefore of no value in making the course. Fog and clouds prevented observations with the sextant but under these conditions the vessel was successfully steered by the wind as a guide. Here a new difficulty arose in addition to the ice movements ; the wind died away and in the fog and calm, caution and experience were the main sources upon which the commander depended for the safety of his vessel and to make his course to Byam-Martin island. Pack ice everywhere was found in the way but persistent manoeuvring overcame this hindrance and the ship made fast to the ice about one mile off Byam-Martin island and 4 miles north of point Langley on this island.

The island is described as a fine one, providing by its vegetation sustenance for herds of musk oxen. In this vicinity codfish must also find in the waters favourable conditions as one, a fine specimen, was found on the ice giving proof of the existence of this valuable food fish around the shores. At this stage no time could be given to fishing nor exploration of the natural resources of the land and water ; progress was essential and therefore no more definite information in this line was obtained. Observation, however, of musk oxen and the cod was important, as every Arctic navigator must keep in view the possibility of serious accident in which his ship may sink and all his provisions disappear, and if the fact of certain localities producing food in its natural state is known, there may be a chance of reaching the locality in the event of disaster.

On Sunday the 28th of August, after religious service, some photographs were taken and the voyage continued, with the intention of crossing Byam-Martin channel. Conditions were even worse, if that could be, for, added to the new ice



Sailors' Home, built by Captain Kellett, 1853, August 30th, 1910.

was old ice, combining to make the channel, now filled with large fields, dangerous to an extreme extent. Old ice, on account of sometimes being awash and the submerged parts extending laterally, made it dangerous to approach these bodies. The gathering of ice in these large fields was due to currents forcing the separate bodies together and no winds to drive them out of the channel. On Monday, the 29th, little water could be seen ahead and several stops had to be made ; one for a whole day. Very little change occurred until the 30th when an opening permitted the vessel to proceed, making Griffith point on Melville island. A partial clearing of the fog enabled the men to see the coast at times, but heaving the lead was necessary to feel the way in approaching Dealy island, a small island on the coast of Melville island. Here a landing was made, and the upper cairn of Captain Kellett, R.N., Commander of the "Resolute" in 1852 to 1854, was visited. The records were left of the voyage of the "Arctic" near the flagstaff. The ground was quite familiar, as Captain Bernier had repaired the cache of Kellett, in 1908-1909, the years of his former voyage. Details of this work were published in the report of the "Cruise of the Arctic" published in 1910, including fac-similes of Kellett's documents, discovered by the side of the cache, with the imprint of a bear's paw on the papers.



Ravine in Melville Island, September 2nd, 1910.

Photographs of a boat left by Kellett were taken at the point where it had lain for about 57 years, weathering all kinds of winds and storms, from gentle breezes in summer accompanied by rain to the fierce blasts of Arctic storms and driving blizzards. This old boat was picked up by the men and taken on board for the purpose of placing it in the museum at Ottawa and in its place was left a new boat. The condition of the interesting relic is not here given in detail beyond stating that parts were well preserved but the side on which she had lain had decayed from moisture ; parts of the strakes in the waist had disappeared but the ribs were in place and all the thwarts.

No further time was lost, as the cache was as it had been left when Captain Bernier departed from it in 1909. From Dealy island an open passage of about two miles in width extended along the south eastern coast of Melville island. Cape Bounty situated between Dealy island and Winter harbour, was passed close, permitting a good view of the land. Interesting historical associations with cape Bounty are recalled by the voyage of the "Arctic." The cape was named "Bounty" by Parry then Lieutenant in the Royal Navy and the commander of an expedition to find the northwest passage. A bounty was offered by the British Admiralty to be awarded the ship's company proceeding farthest west towards the Arctic ocean west of North America. As Lieutenant W. E. Parry, in the "Hecla," and Lieutenant Matthew Liddon, in the "Griper," had penetrated through the waters now known as Lancaster sound and Barrow strait as far as longitude 110 47 west near the outlet to the Polar sea, Parry could well claim the eminence of having made a voyage with deep sea vessels many hundreds of miles farther west than any navigator and was entitled to the bounty. Associating the liberality of the Admiralty with the discovery of Melville island and the first point of land reached on the island he named the cape "Bounty." He afterwards discovered the outlet to the Polar sea by sailing to longitude 113° west of Greenwich. The information respecting the discovery of the outlet, nine islands and Prince Regent inlet, was obtained from a parchment left by Parry in a cairn near Winter harbour and discovered by Captain Bernier in 1908 and brought to Ottawa in 1909. The parchment is part of a Mariner's certificate and the account was written on the back and signed by E. W. Parry and Matthew Liddon. Sir W. E. Parry's report upon his discoveries and the part taken by Lieutenant Liddon, in the almost superhuman efforts made to advance with sailing vessels in these higher latitudes, and the hardships endured, contains an account in minute detail. Parry's expedients to keep his men from dying of scurvy are amongst the most interesting descriptions given, as they afford some idea of his great resource as an Arctic navigator. His ship, the "Hecla," was more fortunate in escaping accidents than the "Griper" that accompanied him. The determination, sound judgment and faith in himself were the qualities that distinguished him. In a former voyage, under Sir John Ross, the eastern entrance of Lancaster sound was pronounced nothing more than a bay running in for a few miles with mountains behind it, and not a navigable channel, as Parry supposed it to be, and proved in the expedition fitted out by the Admiralty and placed under his command, with a view of discovering a northwest passage from Baffin bay to the Polar sea.

Finding that the opening continued from cape Bounty to Winter harbour, the "Arctic" made her way easily into the harbour and anchored in 8 fathoms, on the 31st of August. The entrance was made without difficulty by the aid of stone beacon ranges, established in 1909 by Captain Bernier before leaving the harbour on his return voyage to Quebec. All the beacons were found in position and saved the trouble of making soundings for several miles as was done in the previous entry.



Cache No. 3 completed, Winter Harbour, September 2nd, 1910.

CHAPTER III.

While at Winter harbour precautions were taken to land provisions and build a covering to protect them. Unnecessary as this may appear to the inexperienced yet it was reasonable to the men who faced the uncertainties and dangers incident to navigation among islands along a coast entirely uninhabited. Every channel and every body of water was choked with ice, passing out from bays, inlets, channels and from Beaufort sea. Of the three voyages made by Captain Bernier in the "Arctic" the third was the most difficult. The ice of all kinds, from ice that had formed the previous winter to ice showing several years of growth, was at the time being discharged from every channel on its way eastward. This great discharge occurs in cycles of years. Old ice is known by the discolouration caused by soil or sand which marks the years of accumulation. High winds carry across the country sand, gravel and soil, some of which, in the passage, lodges upon the surface of the ice and is covered in the ice forming periods by new ice from rain or melting snow and the water from the sea. Polar sea icebergs are formed in this way and may be forty or fifty feet thick. They differ from glacier icebergs in appearance and weight with less of confined air and, therefore, sink deeper in the water in comparison.

Similar heavy bodies of ice were the cause in the early fifties of the last century of the abandonment of five British naval vessels, namely, the "Resolute," Captain Henry Kellett, commander; the "Investigator," Lieutenant Robert McClure, commander; the "Intrepid," Lieutenant Francis L. McClintock, commander; the "Assistance," Captain Edward Belcher, commander, and the "Pioneer," commanded by Commander Sherard Osborn. All of these vessels, excepting the "Investigator," belonged to the expedition in command of Sir Edward Belcher, but the

"Investigator" was the consort of the "Enterprise" under Captain Colinson, sent in search of Franklin, in 1850, by Behring sea. Lieutenant McClure sailed as far north as the western end of the Northwest deep water passage to Bay of Mercy, where his vessel became fast in ice, and was abandoned, after examination of the crew who had become weakened by scurvy and the rigours of the northern climate. An investigation of their condition had been made by orders of Captain Kellett, the senior in rank of McClure, from Dealy island. The step was taken with a view of preventing casualties that might prove fatal to a large number of men, although McClure and his officers were anxious to stay with the vessel, which had still large quantities of provisions, in the hope that she might be released.

Whilst the general cause of ice movements have been ascertained, the local movements are apparently unknown to any great extent. This, therefore, has led all navigators connected with expeditions for making the Northwest passage, to provide against emergencies and Captain Bernier followed the example set by those who preceded him.

The small building, to protect the provisions left by the "Arctic," was completed, but no further stay was necessary and a north north east wind having, to a large extent, broken the ice, preparations were made to leave Winter harbour. The captain had sealed his records in a tin case and fastened it to the staff on Parry's rock, according to his intentions, made known before he left Ottawa. On the 2nd of September the vessel got clear of the harbour but the departure was more difficult than the entry, due to fog which obscured the beacons. No leads to the south could be seen and, therefore, it was necessary to proceed in a northerly direction. The course was along the land as no openings were seen to the south, and the ice reached, so far as the eye could tell, across to Banks island. This island was sighted about cape Hamilton but as no open water appeared, no advance could be made towards it. The second officer was sent to the mast head but no openings were seen in any direction. The vessel had progressed some distance but owing to the solid compact condition of the ice it was decided to give up any further attempt to force the ship and endanger the lives of all on board. At the turning point cape Dundas, Melville island, was sighted, 25 miles off, bearing N.E.



Melville Island, bed of river, Sept. 2nd, 1910.

The following is an extract of a typewritten copy of the report of the second officer Robert S. James to Captain Bernier :—

" On September the 2nd I went to the crow's nest to see how it looked southward, after remaining a while I fancied I could see ice in the port hand and ahead, this I found correct for as the ship got nearer I could distinctly see the floe. At 11.30 the ship's course had to be altered a little more westerly and at noon she came to a full stop, then turned more northerly to around the point of the floe. We were at noon about 30 miles southward from cape Providence. Now when I say floe I mean in this case that it was something unusual for I never saw such ice; it must have been 50 to 60 feet thick with hills on it as high as any berg. One saw in coming around this floe it was unbroken, it must have been as old as Adam. I now gave up all hope of ever crossing McClure strait. . . . At 8 p.m. I again mounted to the nest, I noticed a few slight breakages in the ice barrier; the ice now circled around to westward and northward right into Liddon gulf. I now saw that our chance to cross McClure strait was finished; I could see cape Hamilton and land in vicinity quite distinctly. . . . We were now 30 miles S.W. of cape Ross, Melville island and had reached the farthest point in this direction of any vessel. . . . At this point the vessel's head was turned towards Melville island eastward and beat a hasty retreat, for the easterly wind was pushing the ice on Melville and it was only by hard work that we got back to cape Providence."

On September the 3rd, the weather was most unfavourable, rain was falling and freezing. The vessel was steered along the coast and during an interval the weather cleared a little, musk-oxen were seen by Captain Bernier on the shore near the beach. The second officer and four men were sent on shore to secure some of the animals; they killed twenty-three of them and it took all day from 8 a.m. until 6 p.m. to convey the carcasses on board ship. The wind was rising from the N.E.; notwithstanding the head wind the vessel passed Phillips and Hearne points going slowly without steam. On the 4th September the " Arctic " passed Winter harbour and cape Bounty and was abreast of Skene bay at noon. In passing Beverly inlet a good view of it was obtained, it is surrounded by highlands and would not evidently be a good winter harbour as very little sun is likely to shine around the shores. From this point the vessel worked towards Byam-Martin island. The ice around the east coast of Melville island and the west coast of Byam-Martin island, consisted of old ice in large pans, making it difficult to navigate. In working towards Byam-Martin island the course was changed to the north but getting opposite point Langford on Bathurst island, the " Arctic " had to return southward along the coast of Melville island in Byam-Martin channel. On the 6th September the vessel passed cape Gillman on Byam-Martin island, three miles off shore; the course was shaped for cape Cockburn on Bathurst island which gave good leads. Shortly after this cape Playfair, on Bathurst island, was sighted, and then Mt. Bullock, which is about 1,000 feet high. It was impossible to use the compass and the vessel was compelled to make her way by sighting the land. On September the 7th the water was very thick with slob ice, but the " Arctic " approached cape Cockburn which was bearing N.E. three miles. At this point an examination was made of the vessel's sides at the water line, to ascertain if she had been badly chafed or cut by ice. Moore island and Baker island were successively passed and Browne island was reached, lying about two miles off. The vessel was then making good way under sail. On Thursday the 8th, the course was taken towards cape Hotham on Cornwallis island, and in that direction a great deal of ice was scattered about the strait.

The channel was crossed with difficulty and Beechy island passed, the ship was now making good way at the rate of nine knots an hour and then progress was made towards cape Bullen, some long squalls accompanied by rain and frost occurred on the way. The rigging on the windward side was covered with ice which made it difficult to work the ship. The vessel, however, on approaching Admiralty inlet was kept away from cape Crauford during a snow squall making it necessary to

take soundings. The crew was at this time set to work taking off ice that had formed on the rigging and deck; everything was secured in anticipation of a heavy blow. The snow continued more or less in squalls. The course was now shaped towards Admiralty inlet and in approaching the inlet three icebergs were noticed at the entrance; they had grounded on a shallow bank. It is usual, and not at all an uncommon occurrence, for icebergs to ground on these banks at the entrance of the inlet and also, at cape Crauford.

The ship had made good progress under sail, with a fair wind; the weather had cleared and the "Arctic" passed Lord Strathcona sound and then Adams sound, where Arctic harbour is situated, in latitude 73 0 8 N., longitude 85 03 W. As the vessel passed along the land the formation was carefully observed and a number of photographs taken. Shortly after, Richards islands, consisting of four different islands, were observed. Here it may be noted that there are four islands and not three, as indicated by the chart. The next important place is Yeaman



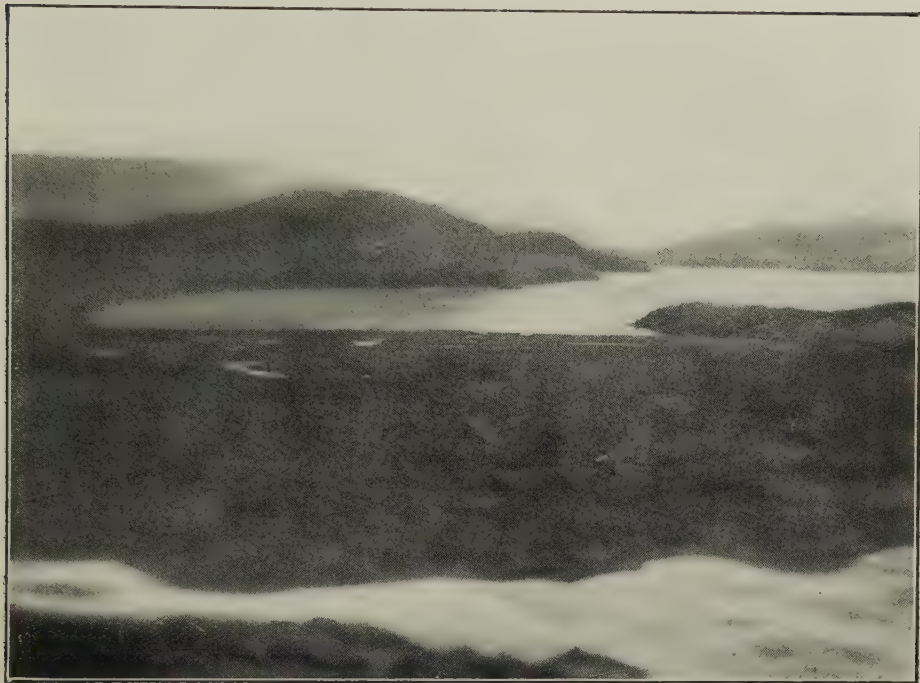
The Eskimos of Arctic Bay, September 13th, 1910.

island; there was not much ice in this part of the inlet at the time and at 8 p.m., on Saturday, the 10th of September, the vessel came to anchor in 25 fathoms of water off Kikertoo. In English the name "Kikertoo" is a high mound, and Ekertoo a small mound. On the following morning the anchor was raised and the vessel proceeded farther in the inlet. While opposite Ekertoo it was noticed from the mast head that the whole bay farther along the inlet, was full of old ice, this fact determined the point respecting the selection of winter quarters; the bay would certainly be an advantageous place to begin operations in exploring the country, but the question of being able to leave in the early part of the summer, led to the decision of turning back to find another place for winter quarters. The vessel was put about and shortly after she sailed into Arctic bay. This is a fine bay with a good entrance, having plenty of room for a fleet of ships. The place chosen for winter quarters was near the bottom of the bay, in twenty-five fathoms.

of water, one-quarter of a mile off the west shore. In the vicinity of this anchorage there is an Eskimo settlement. The natives were evidently pleased with a visit of a vessel and went on board by permission of the Commander. Not only the men, but the women and children, to the number of eighteen, clambered up the side of the ship and got on deck. According to the custom, the men were given tobacco to smoke which they requested, and this indicates a friendly feeling.



Entrance of Adams Sound.



Entrance Johnston Harbour, Adams Sound, September, 1910.

CHAPTER IV.

On Tuesday, the 13th of September, the crew was put at work unbending some of the sails, with a view of putting the vessel entirely in winter quarters. The commander went ashore to pay a visit to the Chief of the Eskimos, whose name is Nasso, and to have a census taken of the natives in the locality.

Before describing the preparations for putting the vessel into winter quarters and the fall explorations, a short historical sketch of the discovery of the entrance of Admiralty inlet and a description of the geological formation of the surrounding country may be interesting to those unacquainted with Arctic explorations.

The famous discoverer Parry when returning from his discovery of Lancaster sound and the nine islands now called the Arctic Archipelago, entered the inlet and sailed down in the "Hecla" to cape Franklin. He named the inlet Admiralty inlet in honour of the British Admiralty which commissioned him, in 1819, to search for a northwest passage to the Polar sea. He considered it imprudent to risk his vessel, which had already withstood many storms and much ice-pressure, in the inlet, then full of ice. The danger of being beset also faced him and perhaps unduly delayed his return to England with the report of his important discoveries. Parry had sailed down Prince Regent inlet, west of Admiralty inlet, 150 miles on the way west in search of the Northwest passage, but this inlet was comparatively clear of ice. On entering Admiralty inlet, he believed that it ran far to the south and surmised that the land between Admiralty inlet and Prince Regent inlet was an island, in this he was not quite correct for Admiralty inlet ends in a bay in Baffin island, leaving a considerable width of land between the bay and Fury and Hecla strait and part of the gulf of Boothia.

Captain Adams of the whaler "Arctic," surveyed Admiralty inlet in 1872 and named Richards islands and Yeamans islands. A sound named Adams sound, after this explorer, running eastwardly for some miles, was also entered and Arctic bay, at the northwest entrance of the sound.

The entrance of Admiralty inlet is about thirty miles in width and at the western side, around cape Crauford, are dangers requiring a wide berth when entering. In the entrance icebergs ground but the water may be considered deep for vessels.

Captain Bernier entered this inlet in 1906 and passed south the whole extent until the water became too shallow for the "Arctic" to reach the extreme southern end.

The geological formation is, in a general way, described by A. P. Low in his cruise in the "Neptune," in 1903. It does not appear that Low entered the inlet to examine its shores, but he states that the land on both sides is of the same formation as the eastern side of Baffin island, which is granite, gneiss and other archaean rocks. Prince Regent inlet is described as partly of the same formation, with limestone, sandstone and other bedded stone along the shores.

Chief Nasso informed Captain Bernier that minerals were to be found on one side of Arctic bay; search was made for these minerals by the Captain and quartermaster Chasse, but without success, the only evidence being some copper stains. During the search a rabbit was seen, proving the existence of animals in the vicinity of Arctic bay.

On the 14th of September, being a calm clear day, it was noticed that ice was beginning to make in the bay. An exploring party was made up of the Captain and several Officers, to examine the east side of a large lake. This lake was named Marcil. Explorations were continued; a bay or fine harbour was discovered in Arctic bay and named Johnston harbour in honour of the Deputy Minister of Marine and Fisheries Department. Measurement was made showing the harbour to be two miles long by one mile wide, well-sheltered from all winds and suitable for wintering a vessel. Specimens of various kinds of stone, plants and some Eskimo instruments were collected and taken on board. It was surmised that the



Victor Bay, looking north, September, 1910.

lake which had been discovered would contain fish, and a small party of there or four men, with fishing tackle, was sent to the lake, but no fish of any size were caught.

On the 15th, some stores and the boats belonging to the "Arctic" were taken on shore and placed in safe quarters, then provisions, consisting of pork and bread, were placed under shelter in case an accident might prevent the exploring parties from reaching the vessel at any time. A comparison of the climate between Arctic bay and Winter harbour on the same day of the month, in two different years, shows that ice forms much earlier in Winter harbour. On September the 16th, 1908, the ice in Winter harbour was eight inches in thickness, the anchor of the "Arctic" was raised above the ice which surrounded the vessel; in Arctic bay, 1910, the ship was lying at anchor and the ice just appearing on the surface, in very thin layers.

The explorations at greater distances from the ship were now begun; ice boat No. 1 was got ready and provisioned for fifteen days; fuel, tent and sleeping bags were also taken. The party was in charge of Mr. Janes, the second officer, and the intention of the exploration was the collection of some natural specimens and hunting caribou for fresh meat. The Captain, Dr. Bolduc and a small party proceeded towards Victor bay, and on the way discovered some lakes; the temperature at the time was 27°. The first officer was left in charge of the ship whilst the carpenter was working preparing scantling for erecting a roof over the ship's deck; the Chief Engineer emptied one boiler and kept steam in the other for heating the ship.

The 18th, being Sunday, a religious service was held which Chief Nasso and his son attended. There were on board at the time thirty-eight dogs which were fed daily at noon with seal flesh. In a sally from the ship, a small lake was discovered by the Captain, which he named lake Caron after the Minister of Agriculture of the province of Quebec; a sample of water was taken from this lake for testing. During the next few days the most important occurrences were the setting of a cement pillar by Mr. Lavoie for use in taking observations, and the making of harness of sealskin for the dogs by the natives. The ice had now begun to surround the shores and to form towards the vessel, enabling the observer to go ashore upon it to the observatory, the ice had also made to a depth of five inches on the lakes. It was, therefore, thick enough to draw to the vessel, where it was melted and the water used for drinking. At this date, namely, the 23rd of September, Arctic bay was frozen over but Adams sound was free of ice. The deck covering was completed, but the weather at the time was fine and clear. A half holiday was given the men on Saturday which was made use of by them to visit the Eskimo tupiks. On the 25th, being Sunday, a religious service was held and the natives attended the service. They had no record of the day being Sunday, but noticing that the men were not at work they assumed that it must be the day on which religious service was held. They seemed rather fond of visiting the vessel when permission was given. Whilst the natives seem to look forward to Sunday with some degree of pleasure the men on board the ship found it the longest day in the week, because the monotony was not broken by work of some kind, except by the cooks and stewards. The Captain, however, found it a day of leisure for reading and acquainting himself with the expeditions of former explorers. On Monday, the carpenter had begun the work of making sleds. An incident occurred which created some interest by the return of the cabin boy Chartrand with a fox that he had caught near the lake from which the ice was taken to melt for drinking water. The weather continued fine with the wind from the N. E.; at this period a chart was prepared for the use of Mr. Lavoie, the surveyor, who was preparing for a trip to cape Kater in Prince Regent inlet. As the ice became thicker the men went on shore more frequently. There was no snow on the ground and the sleds could not be used on the land; it was noticed that seals were becoming abundant.

On the 29th of September, the ice being about four inches in thickness, the anchor was raised and put on a gangway on the ice. The surveyor was engaged



Stepping on board, September, 1910.

making a chart of Admiralty Inlet and the known part of Prince Regent inlet. On Saturday, the 1st of October, a calm day, the sun rose at 7 a.m., and the ship had everything in readiness for the winter. At this time the health of the men was good and they desired to go on shore and take exercise; they were encouraged in this by lending them ten traps to set for the purpose of catching foxes. The Eskimos had built their igloos of ice in preparation for the winter but had not a large stock of food at the igloos; the practice amongst them is to cache the animals near where they have been killed. It was learned that they had made preparations for winter by caching a number of animals. The custom of sending the men for exercise was kept up and this appeared to be enjoyed by them in preference to remaining in cooped-up quarters.

So far, Arctic bay had proved an ideal place for wintering and different from the stormy and more rigorous climate of the Arctic Archipelago where high winds almost constantly blow. Snow was seen only in small quantities in the valleys. Some variation in the work and exercise was made by giving a number of the crew work in cutting ice on the lake for use on board ship. The ice was very clear and pronounced by the doctor to be the purest that he had seen in his voyages in the Arctic regions. Some pleasing news had been brought by the party sent to Adams sound where a discovery of copper had been made, and a specimen brought to the ship by Mr. English, the prospector, who was one of the ship's company. He reported that he saw good signs of mineral in the lower end of Adams sound. See report of Mines Department, Appendix 7, for test of these specimens. The second officer, R. Janes and A. English made a second trip to Adams sound for the purpose of prospecting and if possible, securing specimens of various kinds, including minerals.



Arctic Bay, Eskimo Dogs, 1910-1911.



Leaving Camp, October 13th, 1910, Admiralty Inlet, 8 miles south of Cape Cunningham.

CHAPTER V.

On the 10th of October, Mr. Lavoie, the surveyor, first officer Morin, Mr. Mathe and two natives Koudnow and Monkey-shaw started from the ship to survey Prince Regent inlet from cape Kater towards Fury and Hecla strait. Mr. Morin went to the end of Admiralty inlet and the rest of the party crossed the land to cape Kater. The first officer returned to the ship alone as instructed.

Soundings through the ice of Arctic bay were begun by third officer Macdonald and a plan was made. The usual steps were taken to put ballast on board to trim the vessel before she was frozen in solid. Ice was cut and placed in position around the vessel in preparation for banking her sides with snow, when a sufficient quantity could be gathered for that purpose. Holes were made in the ice, at each gangway, to enable the vessel's crew to get a supply of salt water, in case of fire. The water was kept from freezing by pouring petroleum in the holes, and occasionally, day and night, breaking up any newly made ice. Fresh water ice in larger quantities was now brought from the lake, and this work afforded opportunities for giving the whole of the crew exercise in the open air. It was not difficult to convey the ice to the ship as the lake was about nine hundred feet higher than the sea level. Several of the men were put at work to build an officers' igloo and one for use in magnetic observations. Some photographs were taken of Johnston harbour and Adams sound. The Commander of the "Arctic," in several instances, referred, in his log book, to the favourable location of Arctic bay for placing the ship in winter quarters. Up to the 15th of October, the weather had been fine and calm. Occasionally, the sky was overcast, but the sun was shining either on some part of the land or bay for a portion of every day. The absence of high winds was a notable feature of the locality, permitting every kind of outdoor work to be carried on without interruption or suffering from cold; in this connection it may be stated, that in the event of mineral discoveries and prospecting, no

hindrance to operations may be feared from severe storms. In the fall of the year the same conditions enabled explorations to be made inland. Whatever obstructions may be found in the shape of broken and rough ground, it can safely be said that no obstacles arise from weather conditions; generally, the sky is clear and very little snow falls as early as it does in regions along the coast of Baffin island, or those regions where large bodies of water lie opposite the shores. The temperature is extremely low at times, but absence of moisture enables human beings to endure it without the discomfort experienced where the winds are high, the air moist and the precipitation greater.

A guage was set up on the starboard side of the ship, to be observed daily by the third officer who was keeping a record of the growth of the ice. On the 17th of October, the ice measured eleven inches in thickness in the bay, but was from two to three inches thicker in the fresh water lake. At this period, the sun set at 4.40 p.m. On this day, preparations were made to send a party to meet the second officer and his men at the bottom of Adams sound. Captain Bernier and Alfred Tremblay made some searches for minerals around Johnston harbour. In this search some copper pyrites was picked up and it was noticed that the rocks showed stains



Taking in ballast, Arctic Bay, fall of 1910.

similar to copper stains; it may here be stated, that in these efforts to discover minerals no proper means were at hand to test mineralized specimens that were obtained in situ, or from the float observed during the research of any of the parties sent out from the ship. This fact is mentioned so that no misunderstanding may arise from the supposed discovery of economic ores, the reader is therefore referred to the report of the Mineralogist of the Mines Department at Ottawa, who tested the specimens of mineral ore and shale and analysed the coal brought by the "Arctic," from Arctic bay, Adams sound and other parts around the shores of Admiralty inlet. The pyrites discovered by Captain Bernier near Johnston harbour, was said by him to be copper pyrites, and he also stated that the stains noticed in prospecting in the same vicinity were copper stains. Having thus guarded the reader, no responsibility can be taken by the Department for state-

ments of the prospecting parties who, no doubt, believed that they had made discoveries of different kinds of minerals, but may have been mistaken in the kind; the report of the Mines Department is, therefore, the only official guide for determining the various economic ores brought back from the regions where explorations were made by parties from the cruiser "Arctic," in this voyage. Second officer Janes and party returned to the ship at twelve o'clock on the night of the 18th, and reported on the 19th, that a good many caribou, a few foxes and some rabbits had been seen; samples of different kinds of mineral rock were brought in by this party. Snow fell during the night of the 19th, the wind at the time was blowing from the S.E. moderately. The men were set at work on the 20th with shovels to form an embankment around the ship, within the space formed by the tiers of ice that had been placed in the position referred to above. The work was varied by completing the officers' igloo and the observatory. The sun was getting low and was lost sight of at 3.15 in the afternoon, but the moon was shining day and night. During this day, the 20th, deer were sighted about four miles off from the ship, on land, and on the 21st a party was sent out with the object of hunting these animals in order to procure fresh meat, to be used during the winter. The hunters, however, were not successful although seventeen of the animals were seen.

On Sunday, the 23rd, the sun shone for a portion of the day but there was very little heat felt from it. The Union Jack was sent up to the mast head and was observed by the natives, who enquired the reasons for raising the flag on this particular day of the week; as far as possible the object was explained, informing them, further, that the flag was theirs as well as ours, it seemed to please them. Photographs of the King were given to the natives, which had been presented to Captain Bernier by Mr. Tanguay, provision merchant of Quebec; they were much pleased with the attention and placed them in their igloos. On Monday, an igloo was begun for the purpose of placing stores and clothing in case of a fire on board ship, this was an extra precaution and taken in addition to the other arrangements on board the ship itself.



A. English and party.



Moffet Bay, large iceberg at entrance, October 15th, 1910.



Lavoie-Morin party camping 2 miles south of Moffet Bay, southern point, Admiralty Inlet, October, 1910.



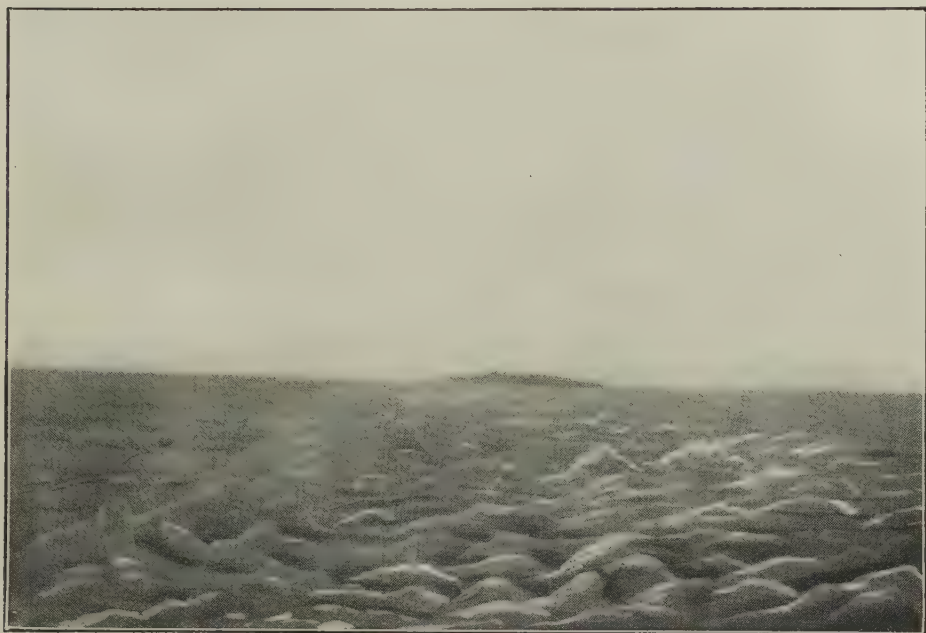
Lavoie-Morin party on Admiralty Inlet, October, 1910.

Mr. English, who had been prospecting around Victor bay, made a discovery of some shale or rock, which he believed from its weight, was valuable; ten tons of it was afterwards placed on board ship, and the prospector's surmise, as to its value, was not proven by analysis at the Mines Department at Ottawa. It will be observed by reference to the report of that Department, that the shale contains no percentage of oil. The prospecting, both by the second officer Janes and Mr. English, was continued. The weather at the latter end of the month was fine, very little snow had fallen and Strathcona inlet was open for a width of about half a mile, but Admiralty inlet, generally speaking, might be considered closed, so far as the working of ships is concerned, at this period of the year. The days were becoming very short, the sun rose over the hills at about nine o'clock a.m.

On the 31st of October, Mr. O. J. Morin, first officer, arrived from the extreme southern end of Admiralty inlet, in $71^{\circ} 3' N$. He reported that he had left Mr. Lavoie, the surveyor, and party, all well and going to Agoo, and, further, that it was the intention of Mr. Lavoie to leave caches at different places. Mr. Morin had returned by another route from that which he had taken in going to the end of the inlet. He had called at Moffet bay, where he had seen some deer going south in their migratory movements from the more northern parts of Baffin island.

The first of November was a very fine day for the time of the year. The day being All Saints, the crew and officers spent a portion of daylight on shore. The search for minerals was maintained notwithstanding the short period of daylight, by Mr. English and Alfred Tremblay, in the vicinity of Johnston harbour. It had been observed that gravel and rock gave promise of containing minerals of one kind or other, and samples were brought to the ship.

The health of the men had been carefully looked after by weekly inspection, so that Dr. Bolduc was able to report, on the 2nd of November, that the men were in a healthy state. When the natives came on board the ship, information was obtained from them by questioning; much local knowledge of Admiralty inlet and the northern part of Baffin island was, therefore, acquired.



Most easterly of Richards Islands, October, 1910.

On the 4th of November the sun had disappeared from the horizon, but when the sky was cloudless the moon shone more brightly than in southern regions, giving sufficient light for movements about Arctic bay. There was sufficient light to continue the work of sliding ice from the lake to the vessel. Movements were made during twilight. Although the sun was not visible from the ship, yet it shone upon the tops of the highest hills on clear days up to the 6th of November; after that there was but very little daylight and no reflection of the sun anywhere. The weather at this time became much colder; the sails, which had been unbent and placed in the after locker, were taken from the locker, examined and dried. The men were occupied in several kinds of work and service; some were hunting seals for food for the dogs, some were prospecting and others were procuring ice for fresh water. A large quantity was necessary for melting and use in drinking, cooking and heating the ship by means of steam.

Some observations were made around the shores of Admiralty inlet, and it was noticed that the ice grounded at different points at low water, indicating that there are shoals in the inlet running out from the shores.

Provisions for the months of November and December were taken on shore and put into the cache. An eclipse of the moon gave an opportunity for observations to get the correct time. The chronometer was fast of Greenwich time, forty-three seconds, shewing that it had gained from July, when the vessel started, to the 17th of November. Some change from the ordinary and monotonous condition occurred by the return of Mr. Lavoie and party from Agoo. Mr. Lavoie reported that he had reached thirty miles north of Agoo in Prince Regent inlet, and, also, that he had seen sixty Eskimos at Agoo; two of these natives accompanied Mr. Lavoie to the ship and from them information was received respecting the west entrance of the strait and some description of the passage into Fury and Hecla strait. It is worthy of notice that the weather, in Arctic bay, was exceedingly fine for the time of the

year, namely, the 20th of November. The ice was then seventeen inches thick in the bay, the temperature of the water twenty-eight degrees and the snow on the ice about four inches in depth.

From this time on it was difficult to keep the crew engaged at different kinds of work owing to the darkness; it was useless to send research parties to any distance from the ship and it was impossible to hunt. The Eskimo village was occasionally visited for the purpose of securing information about Baffin island. There was very little snow on the ice, therefore it was not possible to proceed with the embankment of the hull. The only exercise that could be taken was marching around the vessel in order to keep the men in a good state of health. The weather continued mild for this high latitude; some indoor work in the line of developing photographs and making plans was performed by the officers. The engineers were also engaged in overhauling the machinery. The measurement of the thickness of the ice was kept up and thermometer readings recorded.

In order to keep the men in good humour under the very dismal conditions prevailing during the twenty-four hours of darkness, concerts were given by those who were singers and players of instruments. These efforts were enjoyed by all on board including the Eskimos; on occasions of this kind some of the Eskimo people belonging to the village visited the ship and a few of them sang Eskimo songs; an effort was made to interpret English and French songs to the natives, by this means those on board were kept interested although under unfavourable conditions. There was no prospect of daylight returning until February, and it may, therefore, easily be imagined that the ingenuity and resources of the Captain and Officers were taxed. Fire drill formed part of the exercise on board, and the inspection of the men's quarters as well as their persons was kept up by the doctor and other officers. As evidence of the mild temperature existing, it may be stated that ice increased in thickness during the week beginning the 20th of November only one-half an inch—the total thickness being seventeen and one-half inches. Valuable reports of the wind and its velocity could not be made, due to the calm and the shelter from the surrounding hills. There was neither twilight nor light of any kind from the sun excepting a bright belt low down in the sky towards the south.



Sawing ice, Lake Caron, November, 1910.



Inside Massan's igloo, November, 1910.

Referring to the records that were left at Ponds inlet on the way west, these records contain a description of the proposed voyage of the Arctic to make the North-west passage. As the attempt to pass into the polar sea was not successful, Captain Bernier desired to send letters to the outside world from the station at Ponds inlet, apprising the Department of the whereabouts of the Steamer "Arctic." The second officer was instructed to make ready with some men to proceed to the whaling station at Ponds inlet, with mail from the ship for the officer in charge of the station, to forward by the first whaling vessel that might pass out for Dundee or any other port and to transfer this mail on arrival.

This trip to Ponds inlet could be made by the use of some of the dogs. In addition to preparing for this expedition, some of the men were occupied in removing stores from some of the rooms, in order that workshops might be fitted up for carpentry and machinery work.

During the latter part of November, the darkness had increased and fogs had prevented the men from leaving the ship. The frozen fogs intensified the darkness, but on days in which there was no fog, the men were employed drawing snow from a distance, that had been gathered in heaps on the ice of the bay. The snow-fall up to the 1st of December, measured only five inches in depth, therefore, making it necessary to gather snow at a distance.

On the 7th December, the embankment around the vessel was nine feet high, seven feet in width and twenty feet longer than the ship. This made the quarters within the ship comfortable, the temperature varying from sixty degrees to seventy degrees as compared with fifty degrees in other years, with similar embankments.

The weather at Arctic bay continued comparatively mild and when the sky was cloudless, the moon produced a cheerful feeling. Of those so disposed, the officers and men of the ship, were engaged in writing letters to be sent to Button point by the Second Officer and party. The mail was closed on Sunday, the 11th of December, at 9 p.m., and on Monday, the 12th, Second Officer Robt. S. Janes

and party left the ship for Button point with three sledges, thirty dogs and one native who was sent with him to return immediately from Button point, after delivery of the mail by Mr. Janes.

The weather was becoming cold; on the 15th of December the thermometer recorded 30 below zero. Study was being made by the Captain at this time of the charts and reports of former explorers of Fury and Hecla strait, with a view of passing down from Prince Regent inlet through Fury and Hecla strait and Fox channel into Hudson bay with the ship in early summer. The natives who visited the "Arctic" had been along the coasts of those waters, and their knowledge was useful in arriving at a conclusion respecting the possibility of getting through to Hudson bay by the channels just mentioned; they stated that the ice was always late in leaving Fury and Hecla strait, and still later in Fox channel. It is a well known fact that very heavy ice, in large quantities, is carried each year into Hudson bay and it often blocks the western end of Hudson strait; Captain Bernier had some experience in navigating Hudson strait and Hudson bay in 1906. The natives mentioned the difficulties that a vessel would have in passing through Fox channel. While discussing the matter and questioning them on various points, they made their knowledge somewhat clearer by outlining the coasts and the channel on paper; they are able to fairly outline coasts and rivers but have no knowledge of the compass directions. Several rivers known to them entering into Prince Regent inlet afford spawning grounds for salmon, and these fish are plentiful at the spawning season of the year.



"Arctic" by moonlight, January, 1911.

As Christmas and New Year were approaching, preparations were being made to observe them, both in a social and religious manner. Reference has been made to the darkness in which the bay and land were enveloped in foggy weather and when the clouds were dark and hung low, shutting out the light from the moon and stars. It is, however, worthy of mention, that quite a change was brought about from this condition on days and nights when no clouds or fog obscured the light reflected by the moon. At full moon on a clear night or day it was possible to take photographs of the ship, and several were taken by moonlight; these photographs developed in a fair way, but, of course, the prints did not shew the objects in as clear and as well-defined manner as photographs taken in daylight.

Nothing of great importance occurred on board the vessel to note, but the climatic conditions are worthy of attention at this period. Colder weather had set in, but it was calm, permitting the men to go on shore for exercise, and to examine the traps that had been set. The thermometer registered thirty-two degrees below zero outside the ship, but no discomfort was felt in moving about as the men were well clothed in furs and ordinary woolen clothing. The temperature of the water was 27° Fahrenheit and the snow upon the ice was six inches in depth. On Sunday, the 18th, the weather was clear and the thermometer showed 36° below zero. Some idea of the temperature within the ship may be gathered from the fact that the temperature of the Captain's room below deck was 60° without a stove, making it comfortable for sleeping quarters.



Old Eskimo Village.

As Christmas was approaching an invitation was given Chief Nasso to take dinner on board the "Arctic," by way of impressing him with the hospitality that the Captain was willing to extend to the native tribes. One remarkable incident in connection with some changes in the colour of the sky at the horizon, was the purple tint now observed, encouraging the men to look forward to the reappearance

of the sun, with the advantages of daylight in exploring the surrounding country and making expeditions west and south. At this time some natives with their families from Fury and Hecla strait and Agoo arrived on board the ship, these natives are cleanly, and superior in appearance to the natives of Ponds inlet, not only in appearance but in general intelligence. From them the Captain received important information respecting the movements of ice, in the spring of the year and summer, in Fury and Hecla strait and Fox channel. To avoid burdening this account with too many commonplace details respecting the work that was occupying the time of the crew, mention is not made of their daily actions, but changes in the sky may be noted as they cannot fail to be of interest. The purple colour of the belt referred to above had given place to a reddish tinge. Another interesting item that might be mentioned, is the fact that the natives who had arrived from Fury and Hecla strait were disinclined to talk much, and the ruse of entertaining them with the gramophone and other music was adopted to secure descriptions of Fury and Hecla strait, Igloodik, Agoo and Hudson bay. One native stated that he had met Captain Comer, the well known American whaler and explorer, who had made frequent trips to Hudson bay pursuing whaling, securing seal skins, narwhals, whales, walrus and polar bears. It is quite difficult for an Eskimo to concentrate his thoughts for any length of time upon one subject, but they are inquisitive about everything lying about the ship and the machinery in use.

Among the other disciplinary arrangements on board ship were orders to the men to report any dampness in their rooms or bedclothing; this was necessary to prevent the crew from contracting severe colds that might end in pneumonia or other affections of this nature. Dr. Bolduc made weekly inspections of the quarters of officers and men to be certain that the rules were being observed, and so far, all on board remained in a good state of health. In addition to this precaution, the natives were sent to hunt deer to provide fresh meat for the purpose of changing the rations from salt or canned, with a view of preventing scurvy. At times the hunters were successful, but not always, and this was much regretted, as the anxiety always remained of the dreaded disease if the food was not varied. It is hardly necessary to mention the fact that animal food formed the mainstay in the northern climate. In addition to the efforts referred to, the question of making the quarters comfortable by lighting fires in stoves was considered, for the mercury had fallen to 48° below zero; singularly enough, the men did not wish to have the fires started because the lamps gave sufficient heat for comfort, and any additional warmth would certainly overheat their quarters.

Christmas day was fine and calm and all preparations for celebrating the day were completed. Forty natives from the Eskimo village, including those from Fury and Hecla strait and Agoo, went on board the ship and amused and interested themselves, in various ways. Some of them attended the religious service which formed part of the day's engagements. Although silent and well-behaved, they seemed to be endeavouring to comprehend the meaning of the service and its purpose. Others of the natives roamed about the ship asking questions of those of the crew who did not attend the religious service, about each article that they did not know the use of nor value. A temporary table of some planed boards was arranged at which the natives sat down and food in sufficient quantity and of a kind to satisfy their simple tastes was served. They ate their Christmas dinner with relish and seemed, in their love for those things that appeal to hungry people accustomed to live on raw fish or flesh, to regret that "Christmas comes but once a year."

Some of the attention given the natives in this occasional hospitality had in view the object of teaching them that the Canadian Government was interested in their welfare, to give them some idea of the friendly spirit and to convey some knowledge of the treatment that they might expect, from the employees of the Canadian Government in accordance with British traditions, following the practice of explorers sent out by the Admiralty.

The feeling of friendship was reciprocated by the natives in their willingness to give as much information as they possibly could, from their knowledge of localities in different parts of Baffin island, the waters and lands to the south and west of it. Four different maps, sketching Fury and Hecla strait, part of the Gulf of Boothia, Fox channel and Repulse bay were drawn in their crude way, but still of a valuable kind. The time when the channels were closed by ice and re-openings were quite familiar, and they were able to state that all seasons of opening and closing were not alike. In some years, Fox channel and Frozen strait are impassible, owing to heavy ice remaining from one winter to another in a region where the summer season is short. In addition, these channels are receptacles of larger and broader bodies of water which empty moving fields of ice into them that are carried back and forth by the tide. The special reason for acquiring a knowledge of the general conditions of the several localities has already been intimated, namely, a proposed return voyage by Prince Regent inlet, Fury and Hecla strait and Fox channel, or by Frozen strait into Repulse bay in Hudson bay. This was the intention in December, but the whole purpose would depend upon the season and subsequent conditions.



Inside of Tom's igloo, November, 1910.



On a fine Sunday, March, 1911.

CHAPTER VI.

Resuming the account of the occurrences about the ship, climatic conditions, observations and occupation of the crew, the records show that darkness prevailed while clouds obscured the moon. It was impossible in the latter week of December to engage in any duty requiring daylight even at noon. Print could nowhere be read except by means of lamps. The thermometer readings showed a variation of from 38 to 48 degrees below zero, but in the sheltered position of the winter quarters of the ship no high winds were felt. The ice measured twenty-six inches in thickness, snow on top, six inches in depth, the temperature of the water twenty-eight degrees, the weather, however, was becoming so cold and the moisture in the air made it somewhat uncomfortable on deck, although under cover; stoves were therefore put up. The natives were making frequent visits to the ship and the heat from the stoves permitted the crew of the vessel to make it more agreeable for the visitors.

On the closing day of the year 1910 the Doctor was able to report that all of the crew were in a healthy condition. Work was found for them in cutting and bringing fresh water ice from the lake to supply water required on board. New Year's day was spent by the ship's company in expressions of satisfaction in having so far escaped sickness and accidents and in New Year's greetings. Visits were made by each member to the Captain's quarters to convey their good wishes for the coming year, and religious service was also held on that day. Thirty-four Eskimos from the village went on board to wish the Captain a good year; they were treated with a simple but substantial New Year's dinner and made welcome. Permission was given to the men to dance with the native women who had picked up several dances, namely: polkas, Scotch reels and waltzes, from whalers; by these means the natives were able to enjoy themselves in a manner unusual to them on New Year's day. Part of the music was furnished by a

native who was able to play an accordeon very well, although his repertoire was limited. A Te Deum was sung at the close of the day's proceedings in thankfulness for the mercies of Providence. The natives regretfully returned to their homes of ice and snow, but before starting showed thankfulness for the hospitality of the white man.

At this time an inventory of the food, coal and other articles of consumption was made; the result gave the assurance that if no untoward circumstance should happen there would be ample provision to pursue the voyage by the way indicated through the Hudson bay and back to Quebec. From the explorations that had been made, the men were sanguine that some valuable discoveries of mineral deposits were probable. All parties were in readiness to explore the territory and arrangements were made to be carried out when daylight should return.

On the 4th of January no further evidence of the sun's reappearance was noticeable except a few minutes of twilight at noon. The snow had become hardened on the surface by the intense frost, namely: 40° below zero, but this condition was important and enabled the men to look forward to a hard surface for conveying, on sleighs, the outfit, provisions, and trappings to the different points where surveys and prospecting might take place. All preparatory work, consisting of mending seal skin sleeping bags and bags for conveying provisions, was being performed, and kept the men engaged.

On the 6th the hopes of the men were stimulated by a reddish hue in the sky at noon, in the south; the weather was still cold, the thermometer registering 47° below zero.

A sudden change took place on the 7th; a strong breeze set in from the S.E. accompanied by snow which continued on the 8th; the temperature rose to 25° below zero. The gale blew away the snow from the hills into the ravines. The wind changed to the N.W. and it became colder, registering 30° below zero on the 9th. The ice measured twenty-eight inches in thickness in the bay. The dogs increased in number by a few litters of pups and it became an interesting matter to study the natural instincts of the young animals; it was believed that it would add to the comfort of the pups by putting them in boxes containing straw, but this was evidently a mistake, as they were uneasy and preferred lying on the bare deck and close to spots where pieces of ice had been placed; they thrived under these conditions which, of course, were more natural.

Some of the natives who had visited the ship were about to leave the vicinity, and some rations were given them and their wives to assist them on their journey. The usual work was carried on, including the drawing of ice to the ship. One of the men had sighted some deer when away from the vessel, and on his return related his experience, which created great interest on board and caused the desire to engage in hunting, but it was evident from the experience of the man referred to that the deer were wild and unapproachable. Part of the work on board ship consisted of developing some of the photographs taken by Mr. Lavoie during his fall trip to Fury and Hecla strait. The films, however, in a number of instances, had become damp and not more than half of them could be developed. The wind varied considerably, but continued high from the 8th to the 12th, with fluctuations of temperature; the effect of the high wind was to drive the snow from exposed places leaving the land bare, but considerable of the snow had gathered about the boats that had been placed away from the ship. The weather became fine on the 12th, but on the 13th a heavy gale sprung up; the barometer registered 28.55 and was at this time practically useless; the gale, however, did not last any length of time. Some natives went on board and stated that during the gale they had been unable to kill any game or catch seals and were without food. They were supplied by giving them a few meals on board the ship. The weather at this time had become changeable, varying from clear and cold to strong breezes accompanied with snow.

On board ship the usual round of duties had been kept up, including in-

spection of all the quarters. As a matter of economy, the ashes from the furnace had been retained for the purpose of passing them through a sieve; some of the men were set at work sifting the ashes and considerable coal, that had passed between the bars of the furnace, was recovered and made use of in the stoves set up in different parts of the ship. On Sunday, the 15th of January, religious service, as usual, was held and was well attended, the flag was hoisted to the masthead, and this indicated to the natives, as before stated, that the day was Sunday; they were enabled to see the flag owing to the fact that there was a short period of daylight. The returning light had a sudden and beneficial effect on the spirits of the men, who, during the long period of darkness, had become more or less depressed. They were able also to visit the traps which had been set, which caused an agreeable change from being cooped up and being compelled to stay close to the ship. Nothing, however, resulted from the visit, further than to discover that the traps were buried with snow.



The blacksmith's shop, March, 1911.

Among the observations on board ship was the fact that the vessel had been taking some water, but much less than while moving; the water in the forehold was skimmed with ice, but it was free from signs of freezing in the main hold.

The most interesting event referred to at this time was the return of the Eskimo who had been sent to Ponds inlet with Second Officer Janes, with the mail to be forwarded to the outside world. The native reported that Capt. Adams, of the whaler ship "Morning," had received the mail and departed from Ponds inlet on the 10th of September, 1910. The further information was obtained by the Eskimo, that Capt. Adams had taken seven whales and had left the inlet for Dundee. A report was also sent by Officer Janes concerning the sickness of some of the natives at Ponds inlet and the death of two. Unfortunately the Eskimos had but a scant supply of food and Mr. Janes had been obliged to supply provisions to keep some of them alive. He, however, mentioned in his report that notwithstanding the deplorable state of the natives, they had not touched the caches, which must be taken as a tribute to the honesty of these people.

Referring again to the incidents on board ship and the surroundings, an



Cross erected by the crew of the "Arctic," April, 1911.

igloo was built to protect the young dogs which otherwise would have been exposed to the vicious habit of the older ones attacking the young and perhaps killing them. On the 18th the weather was still cold, registering 35° below zero. The Captain had evidences of the improvident habits and lack of precaution of the natives in neglecting to lay in a supply of provisions in their village. It has already been stated that the habit was followed by these people of caching the animals and fish caught, in the vicinity of the place where they were killed. The cold and stormy weather of two weeks had prevented visits to these distant caches, and therefore, the villages were without a sufficient supply of food. In their extremity Capt. Bernier furnished them with the necessary supply from the ship's stores, thereby preventing suffering and perhaps starvation. He intimates, in his notes, that it was difficult to teach the natives to be more careful against the exigencies of cold and storm, that food should be stored where they intend to take up their abode during the period of darkness in these northern regions. Not only were the natives suffering from a lack of food but one of them had been so badly frozen in one foot that immediate attention was necessary, by the doctor, to preserve this extremity. The young man was able, however, to come to the ship during several days to have his foot dressed, but it was considered better for him to remain on board until he had recovered sufficiently to return to the village.

The Captain had received reports from the village respecting the lack of food, and, on this account, visited the natives to ascertain if the report was true. Unfortunately, the natives were without food and two women were sick; the Doctor was requested to attend these sick people and complied with the request.

In order to leave some permanent mark of the wintering of the "Arctic" in Arctic bay, in the year 1910-11, a cross was erected on East point, in Arctic bay; a copper plate was placed on the cross with the inscription "Holy Cross," the date when it was erected by the Captain and Officers of the Dominion steamer "Arctic," and some particulars respecting the voyage. For the information of future voyageurs, explorers or whalers, Captain Bernier has given the following,

directions for entering Arctic bay. The cross was erected on the east side of the bay to guide vessels in deep water. Running out from the west side is a long spit, dangerous in navigating the bay. This was first discovered by Captain Adams who entered the bay in 1872, in his ship the "Arctic," which ran aground on the spit and stuck fast until she was lightened by throwing overboard some coal. This spit is shown on the plan of Arctic bay, made by Mr. Lavoie and published in this report; by reference to it the depth of water will be seen, as indicated by the soundings made by Captain Bernier.

During the 21st of January, 1911, and a few days immediately following, the weather was cold but calm. The men were not encouraged to leave the ship nor venture any distance from her, and their exercise, was, therefore, confined to walking around the ship for a certain length of time.



Lake Caron. Where ice was taken.

Saturday afternoon of each week the men were relieved of the regular round of duties and permitted to spend the time in repairing their clothes or some other personal matters that they might choose to engage in. Sunday, especially the forenoon, was given to religious observances, reading, and only the necessary labour about the ship, but in the afternoon, the men were at liberty to enjoy themselves by excursions from the ship to visit any points of interest that they found within a short radius. They could not take much advantage of this liberty, at this period, owing to the condition of the weather and the very short period of daylight. They were, therefore, cautioned not to expose themselves in their pursuit of a change from the monotonous life on board ship. Work, of course, engaged their attention on other days of the week, the time, therefore, did not hang so heavily on their hands. Daylight, however, was increasing and some traces of deer were seen, but the animals having passed when it was dark, they were not pursued.



St. George Society's Cairn.

On the 25th the thermometer registered 40° below zero; some difficulty arose in connection with the dogs, especially the young ones, which became benumbed and had to be taken on board again. The cold weather prevented the men from leaving the ship to engage in ice drawing from a distance, but ice was taken from the shore and placed on board to provide fresh water.

On January the 31st, it was 42° below zero and notwithstanding this extreme cold, an effort was made to capture or kill a few deer that had been seen. The chase resulted in nothing more than the exercise which it afforded the men. February the 1st, 1911, was fine, clear, calm and 35° below zero. The work of drawing fresh water ice from the lake was resumed. The Captain and Doctor went some distance to a height of land, to observe the rising of the sun again. It appeared at twelve o'clock noon but the natives had witnessed the rising of the sun above the horizon before the men on the ship. An incident occurred worth mentioning, in the arrival of some natives from the village to consult the Doctor respecting the illness that had occurred amongst the villagers. Their wants in this respect received the attention of the physician.

The weather became most uncomfortable, being misty and raining, with the wind from the northwest, on the 4th of February. The ice measured thirty-five inches in thickness, and the temperature of the water was 28° . The leakage was becoming very much less, the discovery was made that it was above the sixteen foot mark. Work began on drawing ballast to the ship which had been piled on the shore, about ten tons of the rock was conveyed by the use of the dogs and sledges.

On the 7th of February, the weather was 48° below zero but none of the crew suffered.

On Friday, the 10th of February, a native from Igloodik arrived on board ship and it turned out that he had previously met the Captain when he was at Ponds inlet, in 1907. He was able to give some information respecting Fury and Hecla strait. It appears that the ice had not been free in 1910, but the native

intimated that there was some probability of the strait being partially free in 1911; upon this probability the Captain decided to make the effort to pass through the strait towards Hudson bay, when the vessel was released from her position in Arctic bay. An attempt was made to persuade the native to remain on board ship and go with her, but he declined.

From the 10th to the 20th, the weather continued about the same, changing only by the appearance of some clouds that doubtless had been formed in some section where there was a body of water. An Eskimo from the lower part of Admiralty inlet came to the ship but did not appear to have any special reason. The carpenter and some men began the work of repairing the old boat, found on Dealy island and that had been left there by Captain Kellet in 1854—this discovery has already been referred to in this report. A portion of the crew was engaged in building (at the western entrance) a large cairn in honour of St. George's Society of Ottawa, which presented the Captain with a flag before leaving the capital, to erect in some prominent place. In the cairn was placed a record of the request of the Society and the Captain carried out his promise and hoisted the flag on top of the cairn. This incident took place on the 24th of February, 1911.



"Arctic" pastime—playing baseball in 20° below zero, March, 1911.

On the 26th of February, an observation of the height of the sun was taken, the latitude of the place determined as 73° 0' 0'' N., longitude 84° 04' 0'' W. Three Eskimos were engaged at this date for exploring expeditions in the spring.

On the 27th some men were sent out to blast some rocks in which some ore was found and taken on board. The operation of drilling was continued under the direction of Mr. Arthur English; there was a large body of this mineralized rock, apparently more than could be estimated, about 600 feet above the level of the ship and 2,000 yards from her position. There was no difficulty in securing a number of samples of this mineralized rock. Good light enabled the men to engage in work that they had been prevented from doing during the absence of



Chasm in St. George Society's cliffs, 1910-11.

daylight. Mr. Lavoie began observations from the Observatory that had been built in the Fall, and commenced taking angles in Arctic bay, with a view of placing them on the large Admiralty chart.

The first few days of March were fine and on the 4th the temperature had risen from 42° to 30° below zero, the ice, however, in the bay had increased to forty inches in thickness.

Another arrival of a native from the bottom of Admiralty inlet occurred at this time; he brought the valuable information that seals were abundant in the inlet and all danger of scarcity of food for the natives was removed.

A remarkable cliff stretches along part of the bay and a cairn was built on this cliff at a height of 750 feet above the sea level. This cliff has vertical openings which reach from the base to the top of the cliff; here large numbers of birds gather and hatch their young; even in the extremely cold weather, ravens were seen. The cliff is perpendicular, or nearly so, for a distance of four miles and consists of red sand stone, and the base is washed by the sea. The tide rises in some of the openings for a considerable distance back from the face of the cliff.

On the 11th of March, Arthur Tremblay, Quartermaster, was sent with three Eskimos to cape Crauford for the purpose of building a cairn to contain records, his instructions included, among other matters, directions relating to

general observations of ice movements and the grounding of the ice on different shoals, already referred to above; he was instructed also to carefully observe the habits of the Eskimos when left to themselves and the methods they employ in securing food. The party took with them, from the ship, provisions for a month and went ahead with the building of the cairn. The records given by the Captain to Mr. Tremblay were to be deposited.

Work about the vessel was continued, and in order to prevent injury to the rudder the ice was cut away about it for some distance from the stern of the vessel. This action was taken in order to prevent ice, when it might begin moving, from doing injury to the ship and displacing the rudder. Coal was removed from the fore hatch and put in the main bunkers. The weather became more changeable than it had previously been, and on the 22nd of March snow was falling,



Adjusting sextants, preparatory to expeditions, March 14th, 1911.

occasionally; the velocity of the wind reached forty miles an hour and during this high wind all snow was blown from exposed places. Ballast was being put on board and after this was done, the crew began the work of putting on board again the provisions that could be stowed on top of the ballast. Seventy barrels of pork were re-pickled and about 200 boxes of bacon, fish and other stores which had been placed on shore were returned to the ship. After this work had been finished an inventory of the supplies was made.

On March the 15th, Mr. Lavoie left the ship, with his party, to return to Fury and Hecla strait where he had been in December, 1910. He received instructions to trace the shores of the strait, to make surveys where possible and to observe the movements of the ice. In the tracing it was the intention to include part of the shores of the gulf of Boothia. The course he was instructed to follow



Leaving for Cape Craufurd, March, 1911.

was by crossing over Admiralty inlet westward and thence to Prince Regent inlet and then along the eastern shore of the latter inlet to cape Kater and cape Hallowell. His party was composed of himself and two Eskimos.

On the 28th of March the sun was sufficiently powerful to melt the snow and the weather became much warmer and more pleasant; it was possible in this warmer weather to keep a portion of the stores 'tween-decks for present use. Some work that was necessary about the erection of the cross, already referred to, was completed in the latter days of the month of March and this work was taken part in by all hands on board, at intervals, to enable each one of the ship's company to say that he had shared in the erection of the cross.

On the 1st April, natives arrived from Igloodik, Amitook and Agoos, and they informed the Captain of meeting with Mr. Lavoie and party. The natives included the wives of the men and a widow with her two sons about 8 and 10 years of age. Much information was obtained from these people about the strait of Fury and Hecla and the surrounding country. These natives seem to have endured much hardship and travelled with some difficulty, having no sledges. They were included in the census which had been kept of the natives that came on board and they gave such information as they could respecting Eskimos belonging to one place or another. These natives were treated well on board ship on account of their destitute circumstances and the distance from their villages.

Johnston harbour in Arctic bay has already been referred to as a good harbour, well-sheltered, with a good depth of water, but in order to get some knowledge of the actual depth of the water, soundings were made through the ice. It is the opinion of Captain Bernier that this harbour, in the course of time, will be utilized, perhaps, by fishermen, or in connection with shipping economic ores or shale containing a good percentage of oil. The report of the Department of Mines upon the analysis of the shale and mineral specimens, published in this report, affords some idea of the value of the kinds of mineral brought back in the "Arctic." The reports also of the officers published as appendices give some details of the extent of the deposits and these, with the report of the Mines Depart-

ment, are herewith given without any comment. It should be remembered in connection with this account of the discovery of minerals, that the "Arctic" was in Arctic bay during the winter, an unfavourable time for making explorations in ravines containing considerable quantities of snow, and although specimens were collected, here and there, no correct idea of the extent of the deposits of minerals could be obtained. Under more favourable conditions a nearer approximation of the extent of the deposits could have been made.

The extent of Johnston harbour was ascertained to be about seven thousand feet long and half a mile wide and the soundings completed about the 6th of April show the average depth to be about 18 fathoms.



Eskimos leaving for their spring hunting, March, 1911.

In the meantime, a report had been received from second officer Janes, in which he gave some information respecting the natives and their condition during the winter at Ponds inlet. They had experienced a very hard winter and the death of an old man who had been of much service was mentioned. Mr. Janes also reported that Captain Adams, the Dundee whaler, was expected at the station at Ponds inlet in the early spring and the chance would be afforded of issuing to him a whaling license. It has been mentioned that part of the duties falling upon the Commander of the "Arctic" was the issuing of whaling licenses to ships met in the Arctic regions.

The expectation of the early arrival of Captain Adams at Ponds inlet led Captain Bernier to prepare a report of his location, the condition and occupation of the crew, to be sent to the Department at Ottawa.

The weather had moderated so far as cold was concerned and the roof over the deck was no longer necessary. The work of removing it began, but whilst this was going on, severe storms around the 15th of the month came from the S.E. and more snow fell in a short time than had fallen during the whole of the winter. The snow for banking the vessel in the early fall was difficult to gather,



Johnston Harbour, looking N.E.



Dr. Boldue visiting sick Eskimos, April, 1911.

but the heavy fall in the spring of the year made it difficult to keep the vessel's deck clear. In some places it measured four feet in depth on the ice; the sun, however, was having the effect of melting the snow and pools of water were to be seen in places where the snow had blown off during the storm.

The natives were passing from the different villages to points where they engaged in fishing and hunting, and many of them in their movements paid a visit to the "Arctic," some out of curiosity and others to obtain small articles; during this migratory movement Mr. Vanasse secured much information about the natives in the villages between Fury and Hecla strait, Prince Regent and Ponds inlets. Most of these natives varied their hunting operations by trapping, killing deer and spearing seals.



Eskimos and members of the crew.

During the week between the 15th and 20th some blasting was done for the purpose of getting out more shale. On the 20th Mr. A. Tremblay who had been sent out to cape Crauford to observe the ice movements returned to the ship and made his report. At this time the spare sails were taken from the lockers to be spread on the upper deck for airing and drying. It was found that the cotton sails were damaged by moisture. Captain Bernier, as the result, after a careful comparison between the cotton and hemp sails that had been stowed away, recommends that hemp sails be taken by Arctic vessels in preference to cotton, as the hemp is far less liable to injury from dampness, which cannot be prevented, while remaining in enclosed places on board. An incident is related concerning the readiness shown to purchase, from the natives, deer, as a change from the usual fare of salt meat to fresh; one native took on aboard a carcass of deer meat and this was greatly appreciated by all hands. The severest snow storm of the winter occurred on the 21st and 22nd, in which two feet of snow fell, hindering to some extent the work about the ship; when snow that had fallen on the deck and around the ship had been removed, men were set at work to cut the ice forward and aft. The water had begun to rise upon the ice from the weight of the snow in the vicinity of the vessel.

Mr. Mathe was sent to Moffet bay to bring some specimens of mica that had been noticed in the vicinity of the bay, and with him was sent an Eskimo. About the 30th of the month the weather was fine and preparations were made to send Mr. English to look for minerals near Strathcona sound. He selected two men from the crew to accompany him, and this small party used dogs and sleds to convey their provisions and necessary outfit.

During the first week of May, the weather continued fine; the men were set at work scraping and caulking the sides of the ship, sails were repaired, and one of the boats coppered. The ice, however, about the ship was still over four feet in thickness.

The time had arrived for making some explorations on land, to add to the information already obtained, and to begin prospecting for minerals in a more vigorous way. The Captain, with fifteen dogs and an Eskimo guide, visited parts of Adams sound, taking on the way photographs, and proceeded to the bottom of the sound about twenty-one miles from the ship. Here, he left a record in the cairn built by second officer Janes in the Fall. On returning to the ship, he found the men were engaged in the work of scraping and painting the vessel, under the direction of the Chief Officer, Mr. Morin, and this officer was also preparing to go to Moffet bay which he had visited on his trip with Mr. Lavoie.



Drying seal skins, May 1911.



Reception day for the Eskimos, May, 1911.

CHAPTER VII.

On the 11th of May, Mr. Lavoie, who left the ship on the 15th of March to proceed to Prince Regent inlet and thence to Fury and Hecla strait, returned.

Mr. Lavoie reported that he had met with an accident through the explosion of a lamp and was slightly injured, causing him to return to the ship a few days earlier than he had intended. The weather continued fine and Mr. Morin, the First Officer, made a trip to the camp of Mr. Arthur English and his party with the intention of ascertaining whether this prospecting party had met with any success in the discovery of minerals. The Third Officer, Edward Macdonald, was sent to build a large cairn at the place named Royal George and shortly after returned and reported that a cairn of eleven feet in height had been built. On the 15th of May, Mr. Morin returned to the ship with the information that Mr. English and his party were all well.

The Chief Engineer, Mr. John Koenig, was also sent to Strathecona sound to survey it. An observation of the sun was taken for longitude which showed the bottom of the bay in Strathecona sound to be in latitude $73^{\circ} 1' 15''$ N. longitude $82^{\circ} 37' 0''$ W. The sound is thirty miles in length. Meanwhile the work had been proceeding on board ship in preparation for the time when the ice should break up.

The ice was at this time fifty-two inches in thickness and not melting to any extent, it certainly did not at the bottom owing to the low temperature of the seawater. Preparations were made to cut the vessel out of the harbour where she lay. The snow was clear from the top and some ashes were spread which had the effect of assisting in the melting of the ice. This method had been adopted in Winter harbour in the summer of 1909, when the "Arctic" wintered there, and was found effective. On the 23rd May Mr. English and the men that were with him got back to the ship with a number of specimens of mineralized rock.



Eskimos working around ship, May, 1911.

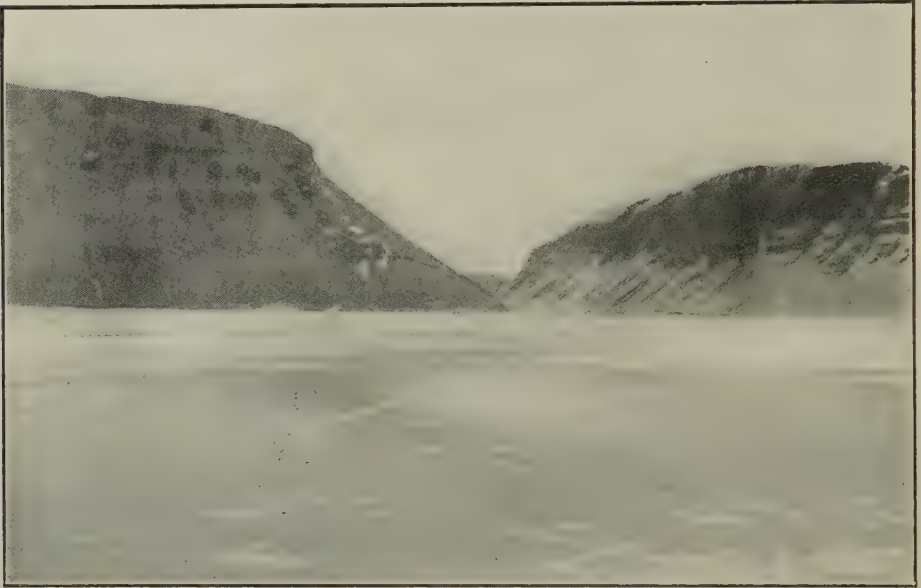


On the mountains—Strathcona Sound, May, 1911.

The 24th of May, being Victoria Day, was celebrated by firing two shots and hoisting the flag on Royal George mountain. The day was celebrated in some other respects in honour of the late Queen, in this far off region.

An incident occurred at this time, an account of which will serve to show the manner in which the natives show their belief in a future existence. One of their

number became very sick and they notified the Captain that he was dying, the Captain and Doctor hastened to the village with the intention of doing their utmost to relieve the suffering of the native in his last hours. It was immediately seen that nothing could be done either to save or prolong the life of the sick man; some medical assistance was given but shortly after, word was brought to the ship of the death of the Eskimo. The carpenter of the ship prepared a coffin. The natives, however, whether from some superstition or disinclination, would not put the body in the coffin prepared and consequently the carpenter had to perform this last act of decency in connection with the burial. The natives, some of whom had been employed about the ship, would do no work for three days, but at the end of the third day expressed a wish for the Captain and crew to take part in the funeral. The highest spot in the vicinity of the bay was selected for the place of burial; the reason given for this strange selection was the belief that the departed



Stratheona Sound.

native would in future have a good view of what might take place all around the shores of the bay. The sad rites of Christian burial were performed by engaging in prayer and singing. Some of the women of the company of villagers were seen weeping, evincing some feeling of sadness and sorrow. After the coffin had been placed in the shallow grave each man in the party carried a stone and laid it on top of the grave. This was done in a ceremonial way to show the natives the sympathy the crew had for them. A large pile of stones was afterwards made by the natives to mark the grave and to protect the corpse from wild beasts. Both men and women were diffused in their expression of thankfulness for the part taken by the ship's crew in the burial of the dead man. They sincerely believed that the departed member of their little community had gone to a world where there was an abundance of game. The best conception that the Eskimos have of happiness after death is the idea of a region where the hunter may indulge his love of hunting where the game is plentiful.

On June the 9th the crew were all at work, some painting, others working at making sails for the life boat, some caulking and others doing work that they were best adapted for in preparation for their time for leaving the bay. Fresh

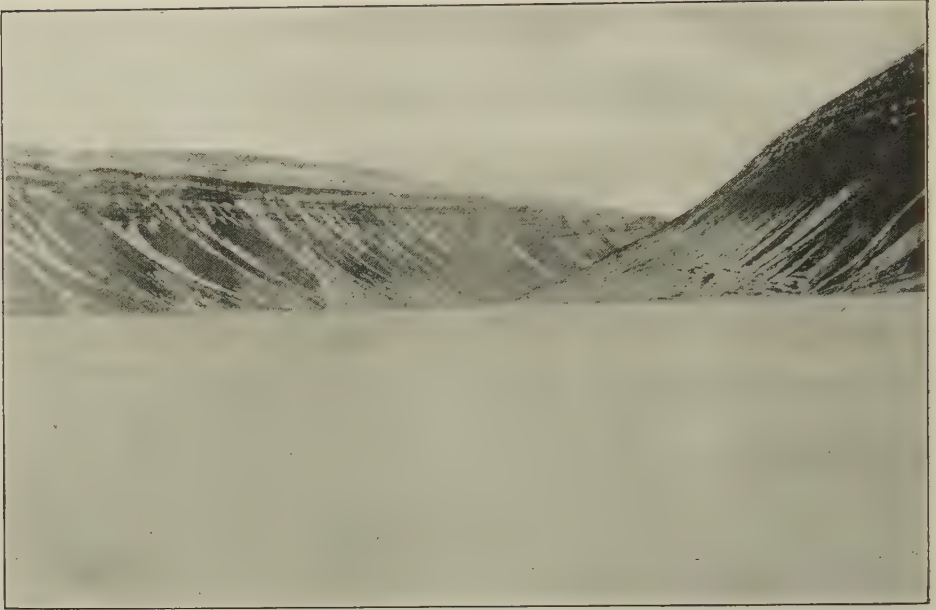


Iron deposit, N.E. entrance of Strathcona Sound.

water was also being placed in the boilers; this water was obtained from pools on the ice. The time was favourable for making short excursions to different places on land for the purpose of ascertaining the natural resources. Some articles that had been used either by natives or white men were picked up; among them was a rusty knife and a spear.

On the 14th of June, the weather was warm and the ice on the bay was becoming porous; there were other evidences of the changes that take place on the land, the game was becoming more plentiful in the country east of the bay and flocks of geese and ducks were seen moving to their feeding grounds; the natives had killed some deer and exchanged them on board the vessel for bread and tea. The men had been cutting ice around the ship to free her and to prevent her from being carried by the ice when it might move in bodies. A visit was made to Victor bay by Captain Bernier, Mr. Mathe and one of the hands where some specimens of copper were taken from the rock. The locality where the discovery was made is in the north east part of Victor bay. Mr. Arthur English kept up prospecting in another direction around the head of Adams sound. The ice on the 20th of June was still thick around the ship, measuring about four feet, but by the efforts that had been made to clear the ice about the propeller and rudder, part of the crew were able to start raising the propeller from its position for examination, by means of shears; the royal yards were sent aloft and the masts were scraped.

On June the 24th there was a strong breeze and this was welcomed giving hope that the ice would be broken up in the heavy squalls in Admiralty inlet; this wind, however, had the effect of bringing fog from the land. A remarkable condition in the sheltered bay was the fact that while there was fog on the land the sun was shining clearly on the bay, in striking contrast also was the thick fog reported by one of the men who had been sent to Holy Cross point, in Admiralty inlet. This led to the conclusion that the ice had broken up in the inlet and that there must be large bodies of water to create the fog. New evidence of the



Head of Strathcona Sound.



Grave of Taveng Macket-a-we, Arctic Bay.

change of conditions everywhere about the inlet, was the arrival of some Eskimos with fresh salmon; these fish were now beginning their runs in the streams, in fact, it had been stated by one of the natives, that some of the runs were already over and that the fish were returning to the sea; about two hundred and fifty pounds were brought from Moffet bay.

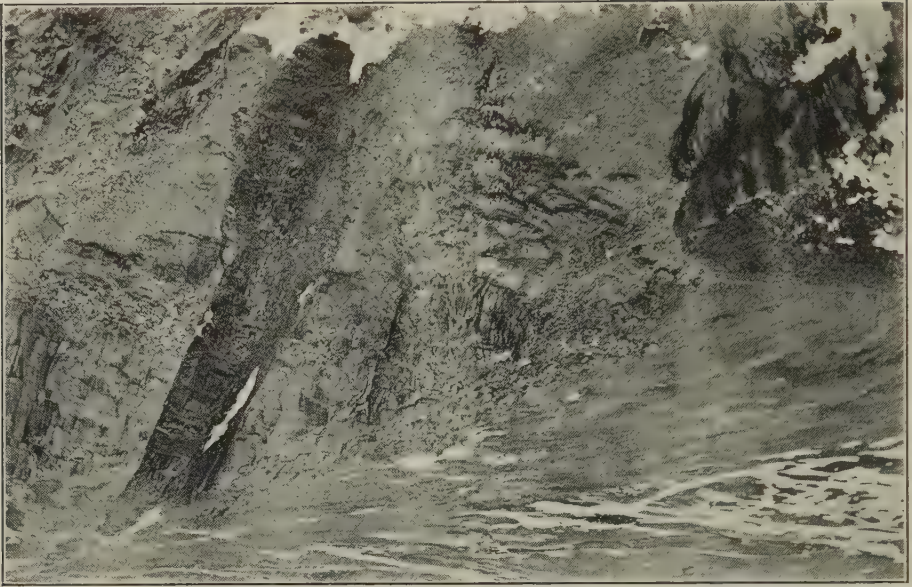
At the end of the month, the painting had been about completed and an inventory was taken of the stores on board and ship's outfit. The "Arctic" was now



Observatory tent, June 14th, 1911.



Arctic Bay, from Observatory, June, 1911.



Dried waterfall, Arctic Bay, June, 1911.

drawing nineteen feet ten inches aft and eighteen feet forward with all the water on board that was required. Mr. English returned from the head of Adams sound with quite a collection of mineral rock.

The first of July was observed as a holiday, and the men were allowed the liberty of going on shore to enjoy themselves by any means they might find of doing so; some of them were given rifles to fire a salute in commemoration of the day. July the 5th was squally with falls of dry snow, the ice was becoming somewhat dangerous around the ship and it was not safe to permit the material on the ice belonging to the ship to remain, it was therefore put on board.

On July the 6th, just one year from the time that the "Arctic" left Quebec, there was no possibility of starting on the return voyage, neither was there any way of estimating the time when the vessel might leave her winter quarters. On this day the variation was established and found to be 96° westerly. The sun's shadow at noon was bearing E. $\frac{1}{2}$ S. The compasses were put in place and adjusted. The Chief Engineer reported that the screw well and the other well were making water; no doubt this was due to the severe frost and the continuous service of the vessel in heavy ice in the Arctic regions. The "Arctic" had made six voyages to the Northern regions. It is quite reasonable to suppose that the severe test to which she had been put, was weakening her planking. The rudder had been cleared of ice and put hard to port and hard to starboard and found that it worked satisfactorily; although severe winds and strong gales from the N.N.W. had taken place, yet the ice had not broken up. The anchor which had been hoisted when the ice was making in the early fall was let go on the 6th of July in eighteen fathoms of water with thirty fathoms of chain. The vessel was cleaned up fore and aft and on the 8th of July was about ready for leaving the bay, the ice in the bay had melted to about one foot in thickness, the dogs were put on board in a large pen, which had been specially prepared. On the 9th of July the natives from the village visited the ship for the last time, and on that day, at 1 p.m., the ship broke from the ice and she was given sixty fathoms of chain; the ice was also freed from the shore and was moving with the wind then blowing a strong breeze from the north.



Tom, the Interpreter.



Arctic Bay, Massan and near relatives, June 23rd, 1911.



Where mineral specimens were found, June, 1911.

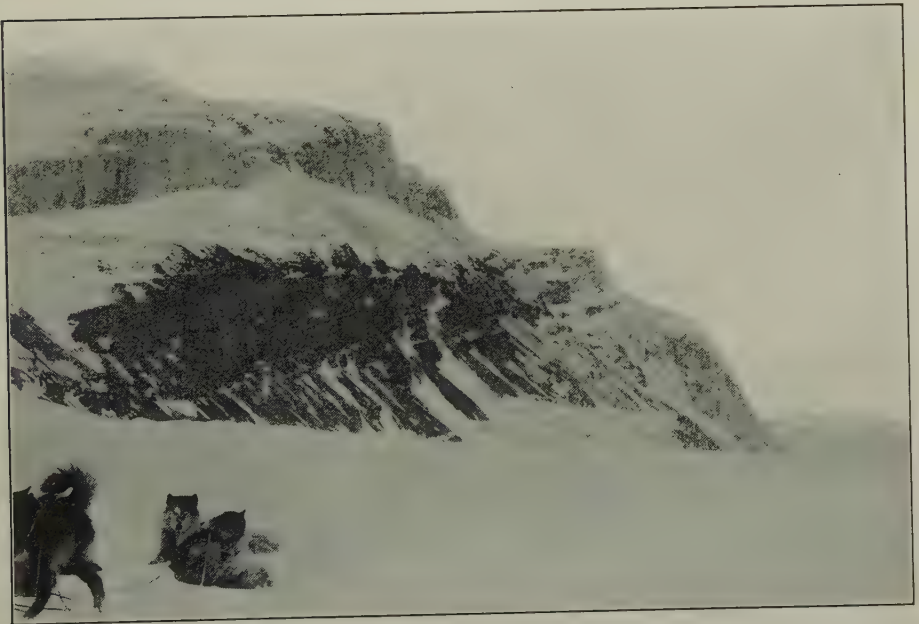
On the 10th the native Omming and his son arrived from a point thirty miles distant from the ship, and brought with them 450 lbs. of fresh salmon; beside this quantity of fish they left considerable at a cache six miles from the ship. The "Arctic" was ready for sailing at any moment. The hawsers and ice anchors were put away. Mr. Arthur English, prospector, had returned to the ship and reported that the ice in Adams sound had not broken, this fact proved that it remained longer in the sound than in Arctic bay. This could not be attributed to the weather, as it had been warm during the first two weeks of July.

In making comparison between the different localities for wintering, Captain Bernier stated that English bay in Strathcona sound is an excellent place as it opens earlier in the season than Adams sound and Arctic bay; it is also nearer Lancaster sound.

The elevation which had been named St. George Society mountain afforded a good view of part of Admiralty inlet and Adams sound, and it was visited by the Captain, who had taken with him a native in order that he might ascertain if Admiralty inlet was yet navigable, but he found that no water was visible. This tedious disappearing of the ice caused considerable impatience, as the vessel was ready to leave Arctic bay. One of the final acts in the overhauling of the vessel was the placing of a new propeller shaft and shipping the propeller. The vessel, therefore, was all ready to proceed on the homeward voyage on the 19th of July, but not even a crack could be seen in the ice in Admiralty inlet when movements of the ice backward and forward might have been expected. The bay, however, was sufficiently open to permit the ship, under steam, to move from her anchorage towards Adams sound, where an opening had been noticed at the entrance of the sound. On the 20th an effort was made to leave the bay but the vessel made only five miles; fires were banked for a short while, awaiting the rise of the tide with the intention of making an effort to leave the bay. A drawback, however, was lack of power of the engine, which is an auxiliary in the movements of the vessel, and not even as effective as it might be if the "Arctic" had forced draft.



The bow of the "Arctic," June, 1911.



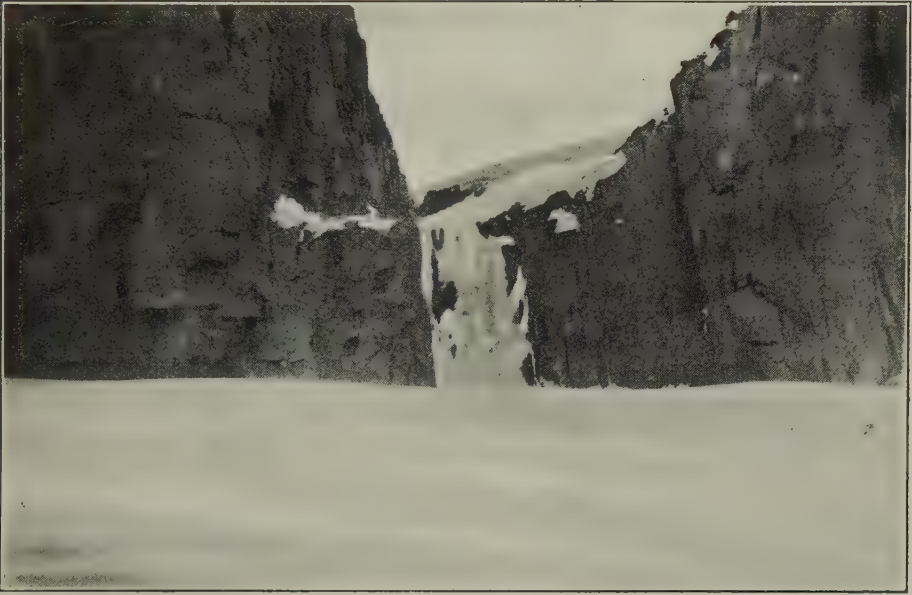
Cape Rotunda, Adams Sound, 1910-11.



Adams Sound.

On the 21st, the ice anchors were let go and some progress was made into Admiralty inlet. Some open leads were found ahead; with the aid of the sails, headway was made. By the use of steam, with the sails, and drifting with the ebb tide, some distance was made northward, but when the vessel arrived off Strathcona sound it was found that the ice made it impossible to proceed. On July the 23rd, however, there was an appearance of a lead to the westward. The anchorage was let go from the ice and the rest of the way was made across Admiralty inlet, when the vessel was again anchored to the ice about three miles from the west shore; soundings were made with the result of finding that the depth of the water was three hundred and fifty fathoms, mud bottom. On July the 24th fog had set in and no movement could be made ahead, the vessel was surrounded by ice and drifting to the south. At this time quite a number of narwhals were seen and two natives went out upon the ice to hunt these narwhals, but did not kill any. The "Arctic" remained beset by ice until about twelve o'clock noon when steam was got up, but very little progress was made, in fact the strong wind from the N.E. pressed the ice upon the vessel and raised her about one foot forward; the rising of the vessel seemed to relieve the pressure while the ice passed underneath. The ice continued to run towards the south, caused by a strong breeze from the north and carried the vessel back abreast of Strathcona Sound. Narwhals were again seen and the natives went on the ice again and managed to kill one, which weighed one thousand five hundred pounds, making five barrels of meat and blubber for the dogs. The ice continued to force the vessel backwards until on the 26th, about noon, she was abreast of Adams sound, in latitude $73^{\circ} 1' 45''$ four and one-half miles from the west shore. The ice was at this time packing only a few yards from the ship; it continued in this condition and came so close upon the vessel that no soundings could be taken. The wind diminished, the ice slackened, the Engineer got up steam on the 29th and an attempt was made to force the "Arctic" through the ice with the aid of boat hooks, pushing the ice aside.

The vessel got clear of the ice and a course was made for Edwin bay and cape Charles Yorke. Outside of the cape, there is a shoal on which the ice was aground. It may here be stated, that ice remains most of the year, fortunately, warning vessels to give it a berth to prevent grounding on the shoal. After rounding the shoal, Baillarge inlet was passed; this inlet or bay is about five miles in depth and two miles wide at the entrance. The entrance may be known by the south head which is perpendicular and the top shaped like a horse's back. The land surrounding the bay is high. Edwin inlet is also a good deep bay with two arms at the north entrance and a bold head somewhat terraced; the mouth of this bay is wider than Baillarge; it is a good harbour, where fresh water can be procured from running brooks which empty into the bay.



Adams Sound, 1910-11.

The course was shaped towards Adams island; while coasting along, a number of icebergs aground, were seen, when the fog lifted or disappeared. It was noticed, in places, that the water was very much discoloured, although no bottom could be found at one hundred and sixty-six fathoms. Off Adams island, a ledge runs at the southwest end but the water is bold at the northeast side. The "Arctic" passed Wollaston islands; a good view of the middle island was obtained, but, as a general thing, many parts of the coast were not seen owing to the fog.

On July the 30th, at 8 p.m., the vessel was off cape Hay; Navy Board inlet was full of ice at this time. It was regretted that distinct views could not be obtained of the mountains, which are, in some places, five thousand feet high along the coast that had just been passed.

The weather cleared on the 31st, enabling the vessel to go at full speed and easily avoid some icebergs and ice floes. During the time just described there was much difficulty in navigating, causing the Captain and officers to be on the alert day and night. At noon of the 31st, the "Arctic" was off cape Byam-Martin and from this point the course was shaped for Ponds inlet, the east entrance of which was sighted in the early part of the afternoon, during an interval of clear weather.



Adams Sound, May, 1911.

On the 1st August in the midst of a thick fog, the "Arctic" was made fast to the ice; soundings shewed a depth of two hundred and fifty fathoms. The lines were cast off and the vessel moved to the ice off cape Graham-Moore but no opening towards the shore could be seen; whilst remaining in the ice the tanks were filled with fresh water from pools on top of the ice. The vessel was now both ice and fog bound and could make no progress. The crew was employed at this time in fishing for halibut which Mr. Janes reported were to be caught in this vicinity, but there was no success, probably from the fact that the water was too deep, being over one hundred fathoms in depth. Some progress from this point of anchorage was again made under steam and sail, but the ice obstructed the progress of the vessel to such an extent that it was decided to make fast to the ice off Button point, and to get the mail which had been brought by Captain Adams. For this purpose two men with five dogs were sent ashore.

On August the 4th the vessel was started again and shortly after arrived at Button point. The land in the vicinity was summer-like as the grass had made some progress in growth. Here, near Button point, a waterfall was observed extending along a distance of one thousand feet from the shore, and falling, altogether, about five hundred feet. Slow progress was made towards Albert harbour and on the 6th of August, at 10 a.m., the ship was anchored in Albert harbour. Immediately after the arrival of the "Arctic" in the harbour, Second Officer Janes, who had left the ship in Arctic bay with an exploring party, on the 12th of December, 1910, came on board.

The steam launch and some canoes were made ready to convey Mr. Lavoie and Mr. Morin to Milne inlet, where it was intended that they should join the vessel; with them, Mr. English and Mr. Mathe were sent to do some prospecting. The Captain with the Chief Engineer and a couple of men, formed another expedition to visit a locality three miles beyond Salmon river, where it had been reported some signs of coal had been noticed by Second Officer Janes, pieces of which had been procured by him. Indications of coal were noticed in a number of places. The Captain's party went beyond Salmon river, eight or ten miles, and then returned to

the river and caught about one hundred salmon with a net; the fish were in good condition. The Captain remarks that on this trip he noticed several deposits of lignite coal, from which several bags were shovelled up, to be conveyed to the vessel. He is of the opinion that an abundance of this lignite can be obtained. Some of it was burned and made use of for cooking; in this test there was very little ash left.

On returning to the ship the crew was set at work to land stores for the Depot in Albert harbour. The Captain, after landing the stores, directed the Purser to enter in the books the quantity that had been placed at the Depot. When this work had been completed, Captain Bernier visited the station to settle everything that required attention and also, to see the natives.

On August the 10th another visit was made to Salmon river to procure more salmon for the ship's use. A shed was built on the shore of the river. On the 13th of August, the vessel got under way for Milne inlet and soon after arrived there. A trip was made up a large river and the launch that had left Albert harbour with the First Officer, Mr. Morin, arrived at the vessel. Milne inlet was left and the vessel passed to the westward to the crossing taken by the natives, when going to Moffet bay in Admiralty inlet. It will be perceived, in this description, that the Arctic was proceeding westward again after her arrival and departed from Albert harbour.

Navy Board inlet was entered on the 15th of August and the vessel anchored six miles south of Canada point, opposite a valley where glaciers form. Boats were manned and sent ashore to examine some coal deposits, which had been observed by Second Officer Janes, while on his way from Arctic bay to Ponds inlet on the journey already referred to.

A trip was made up on the north side of a river, and the men arrived at an elevation of 1,750 feet. Here there were some very striking evidences of former vegetation. There was deep soil and part of an old tree, lying horizontally, was found embedded in the soil. The wood was in a good state of preservation, enabling the men to cut away portions of the tree to convey to Ottawa to be placed in the Museum.* Coal was also discovered and a half bag was gathered up. In addition to these natural specimens, bone of narwhal was found at an elevation of 1,250 feet. This, however, may have been carried to the place where it was found by animals many years ago and was no evidence of the land having been under water since the glacial period. The bone was very porous showing that it had lain in the place where it was found for a very long period of time. In connection with the coal deposits, it may be here stated that a number of places contained specimens of coal which, so far as the men could judge, were deposits and not float that had been carried by some movement of ice and water.

The vessel was got underway again and in leaving Navy Board inlet, passed close to Adams island on the west side of the entrance, around which the water was bold. The course was shaped for cape Crauford, at the entrance of Admiralty inlet, and on the 17th August the vessel had reached Port Bowen in Prince Regent inlet. Sir William E. Parry wintered outside of the harbour in 1824 but during that year lost his vessel the "Fury," in attempting to sail down the inlet. As the "Arctic" proceeded south, she passed Port Neill, a snug little harbour which may be used by vessels for making winter quarters. The place is bleak and does not afford any sustenance for animals, consequently no game can be found there. The desolate character of the surrounding country is due to the proximity of the strait which causes it to be exposed to all northerly winds, which keep the temperature low. Sherer peak in the vicinity is a prominent landmark and is easily recognized. As the vessel proceeded she passed within three miles of cape Kaye, the sounding indicated twenty fathoms of water. It was impossible to see the coast as the ship advanced into the inlet, on account of the almost continuous foggy weather, therefore, a more detailed description of the coast line cannot be given. It may, however, be stated that the water is very shallow along the east side of the inlet, making it necessary to keep the lead going nearly all the time.

As cape Kater was approached it was seen that heavy bodies of old ice were blocking the way, and there was no prospect of passing down to Fury and Hecla strait. A view from the mast head did not give any encouragement for making an attempt farther south. The Captain then concluded that any further attempt to proceed would result in useless efforts to pass through the heavy bodies of ice seen on all sides. The ice was old, formed during several winters and, therefore, impassable. Some of it was aground along the shallow parts of the coast. After a consultation with the officers, the Captain decided that the risk would be too great in making a passage and came to the conclusion to abandon the attempt to pass down Fury and Hecla strait and Fox channel into Hudson bay.

Mr. Lavoie, who had spent some time on the shores of Fury and Hecla strait and Boothia gulf, was requested by the Captain to give his opinion in regard to the improbability of a passage in safety through the waters mentioned. This report is here given.

Prince Regent Inlet,
August 19th, 1911.

To Captain J. E. Bernier,
Commander C. G. S. "Arctic."

Dear Sir,

In compliance with your request to express my opinion in regard to continuing the voyage in Prince Regent inlet from Bernier bay towards the south, and of the advisability of turning back from last named bay, instead of waiting for the breaking up of the ice bodies, I beg to say, on the 17th instant when we came in contact with the pan, the strait was absolutely impassable, the year ice uniting the old floes and pressures in one solid mass extending from the east to the west shore. Although not an expert in ice navigation, judging by the appearance of the ice fields and the details of their formation and thickness as gathered during my expedition of March-April-May you would have had to wait at least ten (10) days before the breaking up. The time at your disposal to finish your work this fall being limited you were perfectly right and wise in not attempting to go through.

Yours truly,

(Sgd.) J. T. E. Lavoie, C.E.

On the 18th of August, 1911, the vessel's head was turned north and with the advantage of a S. S. E. wind she passed out of the heavy ice, and was soon off cape Sherer. At this time the compasses would not work, but by steering by the land and using the lead, the "Arctic" arrived off cape York and out of Prince Regent inlet on the 19th. In passing Navy Board inlet, sailing eastward, some icebergs were seen. In the fog, some icebergs aground assured the Captain of his position. It was well known to him from past observations that icebergs ground in the locality off which he was passing. Towards evening of the 19th the weather cleared up and a small bay was observed which would afford good shelter for a vessel.

On the morning of the 20th it was seen that the "Arctic" was off the low land on the most southwesterly point of Bylot island. The water is very shallow and ships should give the place a wide berth. The course was laid towards Ponds inlet to land the natives that remained on board the vessel and some letters that were to be forwarded by a whaler to the Department at Ottawa, also instructions to the first whaling Captain that should arrive at the whaling station at Ponds inlet.

The land on the north side of Baffin island is very hilly, and along the coast there are some indentations, or bays, that whalers sometimes visit. From the valleys into the bays and into Ponds inlet, glaciers discharge regularly. The coast is generally



Iceberg, Navy Board, Inlet, August, 1911.

lined with icebergs of different sizes, ranging from seventy-five to three hundred feet in height. The water is deep and icebergs ground only when near the shore. Ice floes and pans were occasionally seen in passing; from some of these floes fresh water was obtained to fill the tanks and boilers. It might be imagined at about the 20th of August Ponds inlet would be pretty well free of ice, but this was not the case for the navigation was intricate and caused a good deal of anxiety. The latitude of the ship at noon, was $71^{\circ} 59' N.$, longitude, $72^{\circ} 40' W.$ about eight miles off the land and in about one hundred fathoms of water. It may be noted that the year was one showing an unusual amount of ice around the coasts. It was necessary to use ropes to moor the vessel to ice anchors, to prevent her from getting into dangerous places and also to save her from collisions with icebergs. Occasionally, the ice parted enough to allow the vessel to go at half speed and sometimes full speed, but the fog was so heavy, and the danger so great, that the speed of the vessel had to be checked.

On the 24th of August, the "Arctic" passed "Agnes' Monument" at a distance of about sixteen miles off shore. The vessel was then steered for cape Kater (east coast Baffin island), a little above the 69th parallel. On the 25th the fog cleared, and a Newfoundland vessel fast to an ice floe, bound north was spoken, but being unable to get alongside owing to the fact that the vessel was going in one direction and the "Arctic" another, the attempt to get on board, failed. The flag of the "Arctic" was raised and the whistle blown but the vessel which had got under way, paid no attention to the signals. The speed of the "Arctic" was not sufficient to overhaul her and the effort to follow was abandoned. Photographs and a description of the vessel will enable the Department to identify her and make enquiries in respect to the disregard of the provisions of the Fisheries Act, that require all vessels to secure a license for fishing around the coasts of Baffin island.

Difficulty in navigating along the coast was still experienced from field ice. Although the vessel was in latitude $67^{\circ} 52' N.$ and longitude $64^{\circ} 20' W.$, she was often compelled to stop.

On the 27th the "Arctic" was working towards cape Dyer but during this day, so much ice was pressing on the shore and for some miles off, that it was impossible to make headway. On the 28th, however, steam was got up and some progress was made towards cape Searle, and whilst off cape Durham some schooners in shore were seen endeavouring to get out from the land.

All along the coast thick fog had enveloped the vessel down to the narrowest part of Davis strait, occasionally lifting and allowing the Captain to recognize prominent head lands and points. At noon of the 29th the vessel reached, by account, latitude $65^{\circ} 15' N.$, longitude $60^{\circ} 50' W.$, the soundings varying from one hundred and forty-three to one hundred and twelve fathoms.

On August the 31st steering N.W. to N.N.W. by the compass (reversed) Leopold island was seen bearing ahead six miles and Cobourg island, bearing N.W. by N. by compass, five miles. Many icebergs were seen as the vessel passed Cobourg island, two miles off. The course was shaped for Kekerten in Cumberland gulf; during the passage in from Cobourg island icebergs were seen, but no field ice. This is a promising indication of an open fall in Hudson strait, around the Labrador coast and the gulf of St. Lawrence.

The station at Kekerten was reached on the 2nd of September and the Captain went ashore by boat. He attended to business relating to Fishery licenses and Mr. Lavoie, who had been appointed before leaving Quebec a Custom's Officer, attended to the collection of duty on articles that had been landed at this station. When this business had been completed the vessel set sail for Blacklead island, another station and Eskimo settlement near the entrance of the gulf.

Some books were distributed at this place which had been given to the Captain by the Rev. Dr. Peck to distribute among the natives. Captain Bernier testifies to the noble and valuable work done by Dr. Peck in enlightening the people and teaching them to read. They are not only able to read, but to write letters to their friends and relatives who are dwelling at some distance from them. The natives at Blacklead are not only more intelligent than those seen at Ponds inlet, but are of a finer physique. The work of Dr. Peck, who now resides in Toronto, has been taken up by Dr. Grenfell. The energy and interest shown by this gentleman in



Rev. Mr. Greenshield, Missionary. Blacklead Island, August, 1911.

Labrador is well known the world over, and his good work embraces the education and training of natives at Blacklead. One of the schools was visited and the intelligence and neatness shown in the arrangements and by the children, was very striking, giving the strongest proof of the elevating character of the instruction given. At Blacklead similar business in relation to whaling licenses was attended to and Custom's duty, as at Kekerten.

When this work had received the necessary attention, the "Arctic" was got under way for Niantilik harbour, not far from Blacklead island, in Cumberland gulf, and on the west side, in order to take in fresh water for use on the ship and in the boilers. Mr. A. English, of the ship, landed at this place to examine some mica deposits reported to have been discovered. In his opinion the mica deposits would not pay to work, as they are apparently limited, the mica itself being of poor quality.

The voyage was resumed south, some unnamed islands, described as beautiful, owing to the shape of the rock, between Kokalouie and cape Murchison, were named the "Lemieux Archipelago," after the Honourable Rodolphe Lemieux, who was Postmaster General of Canada when the "Arctic" left Quebec. Cape Murchison was reached on the afternoon of the 4th of September; from there the course was shaped to cape Haven. At cape Haven Mr. Forsyth Grant has a station for trading with the natives. The vessel stopped at this station for a short while.

The voyage was resumed on the 5th and a passage made along the islands, keeping clear of the reefs, which are somewhat numerous. The weather in the meantime was hazy and snow had fallen. Owing to these circumstances, and no sign of life on shore, no landing was made. The information respecting the locality is meagre. There are some harbours around this coast, and more information respecting them is desirable, but under all the circumstances it was considered advisable to proceed on the voyage.

Hall island was passed, and it was noticed that large icebergs from the Arctic sea surrounded the island. The course was now shaped for Resolution island. The waters in this part of the coast are dangerous for vessels, two small low islands, not on the chart, were noticed in passing. It should also be remembered that the lead is not of very much use in approaching the islands and coast, as the sea is deep.

In the early morning of the 6th of September, the vessel was passing Button islands on the south side of Hudson strait; from there the vessel ran for Port Burwell for the purpose of taking in ballast. The land was made off Port Burwell in a whole gale, but the harbour was reached and the vessel anchored in eleven fathoms in the middle of the harbour. When going north some stores had been left at Port Burwell in case that they might be required by vessels meeting with misfortune. These were found untouched, but being on the upper floor of the Moravian church, the person in charge requested the Captain to have them cached in another place. This matter was left for the attention of the Department, the captain recommending that the stores be removed from the church and placed in a cache for the use of vessels, in cases of necessity.

The matter of collecting dues for Fishery licenses and Customs duties was attended to by the Captain and Mr. Lavoie as at the other stations above mentioned. On September the 7th fresh water and ballast were taken on board. While at Port Burwell the Captain visited Captain Jackson, of the "Harmony," a St. John's, Newfoundland, vessel, to enquire if any mail matter for the "Arctic" had been brought. During this time the wind was blowing strong and the second anchor was let go.

On the 12th, ballast and water having been taken on board, and all matters requiring attention having been attended to, the anchor was hove up and the "Arctic" left Port Burwell to pass through Gray strait, between Button islands and the north end of Labrador. When making passage through the weather was clear enough to permit the Officers to count the Button islands; the number is thirty-seven, but this may not include all of the islands, or reefs which appear as islands at low water, in the distance. The vessel was not, of course, close enough

to enable the crew to see all the islands on the north side of them. After cape Chidley had been passed, some small islands were seen not marked on the chart. It was the opinion of Captain Bernier that this portion of the Labrador coast should be surveyed for the benefit of the vessels that may pass through Gray strait in entering Hudson strait.

At noon of the 13th the vessel was in latitude $58^{\circ} 26' N.$, longitude $59^{\circ} 40' W.$, having made one hundred and fifty-four miles in twenty-four hours. On the 14th the vessel was keeping the same course and on the 15th, about noon, Round island was sighted, bearing S.W. $\frac{1}{2}$ S., about seventy miles away. A head sea had set in and with the fore and aft sails set, some tacking was done towards the land, the vessel making but one to two knots an hour. During the 16th and 17th the course for Belle Isle was taken, and at midnight the vessel was well up to Belle Isle strait with the Northern light of Belle Isle, bearing W.S.W. On the 18th, the strait was entered and a course taken along the north side towards Chateau bay.

At noon of the 18th the vessel arrived off point Amour and reported to the Department by telegraph. Several well known points in the gulf were passed. The "Arctic" steered for the middle of the strait between Anticosti and the north shore of Quebec. As the vessel was passing up the gulf some painting was done, and other work on board the ship, to make her look tidy. Considering the fact that the vessel had made a voyage to Melville island and back she looked remarkably well on her return to the mouth of St. Lawrence river. It was noticed, as the important lights were sighted and passed at night in the gulf, that these lights had been greatly improved.

On the 22nd of September, pointe-des-Monts was passed and a course steered to pass outside Metis light. At noon a pilot was taken on board at Father point. The brother of the Captain boarded the vessel with some letters and newspapers addressed to each of the ship's company. The "Arctic" came to anchor at Pilgrims, as she was making no way against the ebbing tide without full steam. On the 24th the vessel passed Grosse Ile and on the 25th, fifteen minutes after twelve, midnight, the anchor was dropped abreast of Allan's wharf in the harbour of Quebec; all hands well after a fifteen months' cruise.

The Captain received instructions to discharge the crew, and a month later directions were sent to land the stores and other material. Specimens of mineral, shale and coal intended to be analyzed and tested were shipped to Ottawa, also the articles to be placed in the Museum.

Immediately after these operations were completed, Captain Bernier proceeded to Ottawa with his logbook and handed it and the reports of the officers that accompanied him, to the Department.

In summing up this report in a general way, it may be stated that the vessel sailed during the voyage about 10,000 miles and returned without any damage beyond the ordinary wear and tear incident to voyages of the same nature in the far northern waters. The "Arctic" is not what may be termed an icebreaker, as she is not equipped with powerful engines, being practically a sailing vessel with an auxiliary engine of no great power, but she was constructed specially for voyages in the Arctic regions, of substantial materials. She is a very handy vessel in ice and withstood the pressure in ice fields, running ice, and occasionally, contact with heavy bodies of ice which an ordinary vessel could not withstand; but having made four voyages of the same kind since her purchase by the Department, under all conditions that prevail in northern regions, it is not surprising that she has shown signs of the effect of the great pressure of immense bodies of ice. The vessel is a good sea boat and easily worked at sea or in ice.

The men did not suffer from want of proper accommodation and were as comfortable as could be expected in the trying weather to which they were exposed. The Captain gave full credit to all the officers and men for the manner in which they performed their duties, and did not record in his log book anything of importance respecting any violation of discipline nor disobedience to orders. He reported

that during the surveying, exploring, and other expeditions from the vessel in Arctic bay and Ponds inlet, the men comprising the parties sent out, covered a distance of four thousand miles on foot and with dog sleds. It was the only voyage of the four in which an adequate number of dogs had been used for exploring purposes.

The northwest passage was not accomplished, as originally intended. That part of the report referring to the attempt to do so contains his reasons for the failure in this respect. In the first place, the season was most unfavourable, owing to the great obstacles from heavy ice in McClure strait, at the entrance of the Polar sea, making it impossible, in his opinion, to pass westward. He has furnished a report from the Second Officer, endorsing this opinion and in returning when intending to proceed through Prince Regent inlet, Fury and Hecla strait, Fox channel and Hudson bay, obtained a similar report from Mr. Lavoie, in which it is claimed that the vessel was blocked by the immense bodies of heavy ice that filled the channels mentioned.

With a view of making the best of his time and opportunity, Captain Bernier concluded to pass the winter in Admiralty inlet, for the purpose of making some observations, tracings and explorations, from a convenient quarter. It had been maintained by him that part of the inlet had not been surveyed, nor had Fury and Hecla strait to the south, and part of Boothia gulf been correctly outlined. Part of Eclipse sound, north of Baffin island also remained unsurveyed. He considered the time of the officers on board, and part of the crew, might well be occupied in tracing the coasts of these waters and prospecting for minerals.

Mr. Lavoie, a land surveyor, was entrusted with the survey, with the instrument in his possession at Fury and Hecla strait, part of the coast of the gulf of Boothia, and in Eclipse sound. He has made reports on his work which form appendices to this report. The three maps prepared by Mr. Lavoie are also published, showing that he has taken great pains in delineating the localities formerly unsurveyed. The Department publishes these maps without assuming any responsibility as to their accuracy of the hydrographic lines of the bodies of water included. The soundings, it may be assumed, are accurate.

Mr. Arthur English was employed prospecting as the principal part of his duties; his report is also published as an appendix to this report in an abridged form. Mr. English had some previous knowledge of mineralogy, and his report is useful in indicating the localities where specimens of ore, quartz, shale and mineral bearing rocks were found.

The report of Mr. Morin, first mate, includes an account of his journey with Mr. Lavoie when he accompanied that officer part of the way to Fury and Hecla strait. This officer, owing to the importance of his position, remained on board, except when his services were required to accompany, as navigator, the surveyor to the places where the work of the latter was performed.

The report of second officer Robert Janes is also published herein, in an abridged form, and contains the main events that happened during his trips of exploration and journies from the ship. This report alludes to some discoveries of lignite coal found in place.

Mr. J. E. Mathe was engaged, at times, in searching for mineral deposits and relates the result of his observations.

Alfred Tremblay, one of the quartermasters, reported upon his trip to Cape Crauford to build a cairn and deposit records. This report is also an appendix.

The report of the Mines Department in Ottawa contains the result of the examination and analysis of the mineral and other specimens. It is also published as an appendix. This report, based on a scientific test of the specimens submitted by the Department of Marine and Fisheries, is official and may be relied upon in determining the value of the mineral specimens secured by the exploring parties of the "Arctic."

The other service performed by Captain Bernier consisted of patrol work in connection with the fishery regulations pertaining to whaling in the northern waters

of the Dominion, and the issuing of whaling licenses to vessels engaged in the industry. Two vessels were boarded and notices were left at whaling stations calling attention to the regulations requiring whaling vessels to obtain licenses, and requesting owners and Captains to recognize the authority of the Department at Ottawa, and the jurisdiction of the Government over territorial waters in the northern regions of the continent.

Interesting items recorded by the Captain of the "Arctic," are the references to fishing for salmon by the men of the "Arctic" and their successful operations at Salmon river, which empties into Eclipse sound, at the junction of Ponds inlet, at the northern end of Baffin island. The vessel was also supplied with fresh salmon by the natives when at Arctic bay, in Admiralty inlet. The salmon are not large but are of excellent quality for the table when fresh, and can be preserved for use by freezing. The abundance in the streams, during spawning season, affords a very large supply of food to the natives who preserve them by a process of drying for future use. Seals and narwhals were also reported abundant, on breaking up of the ice in the spring, by some of the Officers on their return to the vessel from their excursions to a distance, and by Eskimos when visiting the ship.

The Meteorological report was prepared by Mr. Lavoie, who made records daily of the thermometer and barometer. This report appears as an appendix. The Observations will be valued for the information they contain of the temperature of a climate as cold as Winter harbour, in Melville island, and Albert harbour, in Ponds inlet, where the "Arctic" wintered in 1908-9 and 1906-7 respectively, but high winds prevalent in Winter and Albert harbours were not experienced in Arctic bay. It may be concluded from this that the winter in Arctic bay is not so severe as at the other two harbours.

A census of the Eskimos at the localities visited by the "Arctic," a record of the number of miles travelled by the exploring and surveying parties and a list of the specimens delivered to the Mines Department complete the appendices.

APPENDIX NO. I.

SUMMARY OF REPORT OF MR. LAVOIE ON HIS FIRST TRIP TO PRINCE REGENT INLET.

According to the instructions given by Captain Bernier on the 8th October, 1910, to survey Prince Regent inlet from Cape Hallowell to cape Kater, Mr. Lavoie left on the 10th with a party of four persons, Mr. Mathe, geologist, and three natives, one of whom was but a child, two sleds and 22 dogs.

Mr. Morin, with a native, was to accompany them as far as Shinik islands, surveying the south end of Admiralty inlet, which he did.

Mr. Lavoie had but few incidents of note to relate of the first part of the trip; the ice, not being thoroughly fast and set when he left the ship, was responsible for an immersion the day of his departure. This happened on the south coast of Adams sound. A return was made to the ship for dry clothing and a fresh start made the day following.

At point Cunningham, the day following, to prevent a like accident, the ice being very bad, great care was taken and the sleds were kept away one from the other.

Mr. Lavoie decided, and the rule was kept throughout the journey, that two meals a day only would be partaken of, breakfast and supper. The noon lunch, eaten while on the march, consisted of freshly killed seals' liver, when available, otherwise raw meat of any sort.

Levasseur bay, on the east side of Admiralty inlet, turned out to be but a deep canyon between the steep mountains that form the eastern shore. On this day, the 13th, 26 miles were covered. A stop was made on the following day at Moffet bay to take photographs of an immense iceberg and later on of two islands in the Yeaman group, not previously noted on the chart, of which Mr. Morin also took notes to enable him to chart them on his return.

On Saturday the 15th, a stop had to be made to procure food for the dogs which were getting uncontrollable and eating their harness. An island just south of the entrance to Moffet bay, and named "Dominican," the day following, Sunday, by Mr. Morin was the camping ground chosen. Only one seal being captured on Saturday, the party was forced to stay one day longer and were rewarded with a prize of five, which greatly helped the drawing capacity of the dog teams.

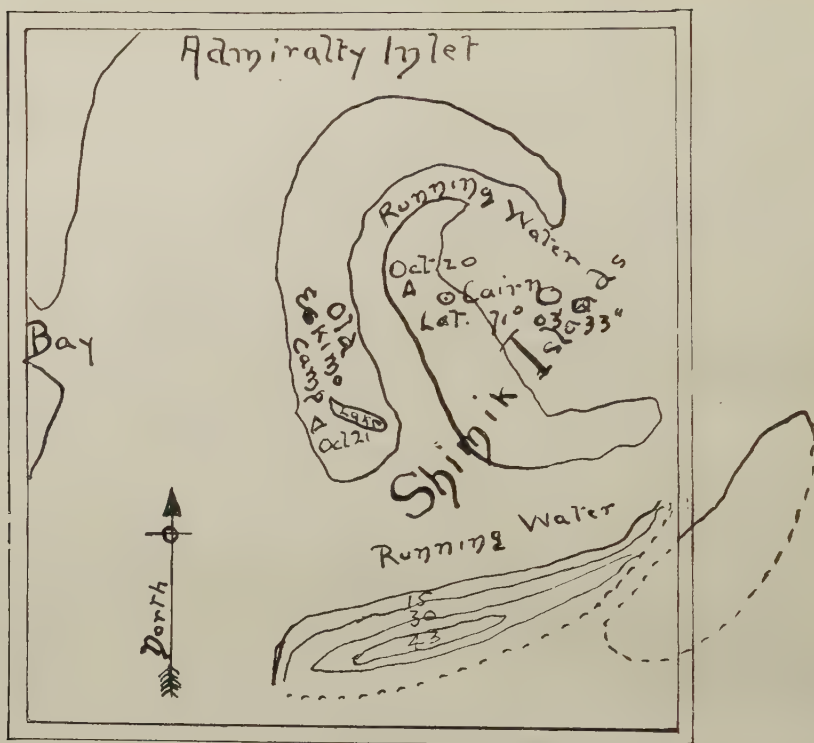
At a distance of some 80 miles from Arctic bay (locality not given) Mr. Morin discovered a vein of mica on the 16th, and 25 more miles were added to the itinerary on that day. Travelling was very arduous during this time on account of broken ice, fog and snow, and the first of the Shinik islands was only reached on Thursday, the 20th. On this day a cairn was erected and the following record was left:—

"Thursday, October 20th, 1910. On this day, two parties composed of O. J. Morin, first officer, with Macket-a-Oui and J. T. E. Lavoie, Mr. Mathe, Monkey-Shaw, Koudnow and his boy, having left the ship 'Arctic', wintering in the Arctic bay, Adams sound, have here built this cairn and left a record inclosed. Mr. Morin having traced the south end of Admiralty inlet is leaving to-morrow to re-turn to the ship, whilst Mr. Lavoie continues to Agoo in order to survey the coast of Prince Regent from cape Hallowell to cape Kater.

"From observations taken to-day, the latitude is $71^{\circ} 03' 33''$.

"G. S. 'Arctic' being at the present time commanded by Captain J. E. Bernier."

A cache was also made at this place and provisions, consisting of biscuits, pemmican, lard, bacon and butter, were left in it. Mr. Lavoie's party being about to travel overland, the natives were sent out seal hunting. Some seals were killed but the strong current took them away from their reach. Some deer were killed, those near enough to the camp were brought in while only the hindquarters of those shot at too great a distance were brought. A certain amount of the meat was left in a cache and the remainder brought along to supply food for men and dogs.



The mouth of the Sapooting river was reached at 3 o'clock of the afternoon of the 23rd October. This is, properly speaking, the most southern point of Admiralty inlet. Thirty-five miles was made from 6.30 a.m. till then; a further five miles was accomplished bringing the party further up the river.

The course of the river was followed, and a distance of thirty-two miles was covered on the 24th. A party of natives on their way from Igloolik to Agoo were met and the two parties travelled together. The river being only some 15 miles in length had now been left behind. Lake Sapooting and a great many other little lakes were crossed, travelling being very hard over portages, the snow being light, not more than two inches anywhere. These lakes and streams are filled with salmon, considered by Mr. Lavoie superior to the Pacific coast fish of the same variety. A half pound of tobacco would buy from 200 to 300 lbs. of this fish and in this way the dogs had ample food.

The natives feed their dogs altogether with the salmon; they are so abundant that they can be caught in the most primitive way possible. A dam of stones is made near the mouth of any creek and on their way to sea, the fish, being too crowded for jumping, are thrown out by hand on the shores, where stones are piled on top to keep them from animals and left there to freeze and for future use.

On the 26th, between 4 and 5 o'clock, p.m., Agoo bay was reached. This bay is, according to the Admiralty chart, Autridge bay. The natives only know the inlets, bays, rivers and lakes by the local names, and as they understand but imperfectly the use of charts, having no knowledge of the compass, the information desired as to any locality is very hard to get as the names given are totally different. Till the bay was actually reached, Mr. Lavoie did not know that Agoo and Autridge were one and the same bay. Although Ponds inlet, Button point, cape Kater, Arctic bay, etc., are inhabited by natives, barely one in a hundred know these places by these names.

By noon of the 27th, camp was made in the Eskimo village at the mouth of the river Ikalo. With the help of the natives this was quickly done. A visit was paid at once to the two principal residents.

Mr. Lavoie was struck by the difference existing between these people and those previously met. Of medium height, of good carriage, of excellent physique and intelligent looking, these natives compare favorably with any North American aborigines. Cleanly dressed, with a certain taste and of good healthy appearance, they are splendid specimens of the northern races. Mr. A. P. Low, in his report



A Group of Natives, Arctic Bay, 1910-11.

on the cruise of the "Neptune", 1903-04, comes to the same conclusion as to their appearance. Mr. Lavoie having decided to spend some days at this place, to increase his knowledge of the Eskimo language, took his quarters in the igloo of the Chief Sigailto. He lived with them and adapted himself to their mode of life, always with the ethnological end in view.

From his hosts Mr. Lavoie heard that Fury and Hecla strait had been opened for three and a half months during the summer. Navigation in Prince Regent inlet would probably have been equally free. At the date of writing, the 29th October, the ice had not yet formed in the deeper waters.

Of the natural wealth of the country, Mr. Lavoie reports that the rivers emptying into Whyte inlet and Agoo bay are all full of salmon of superior quality. Deer are very numerous on the prairie forming the south side of Brodeur island. White foxes are very numerous. A good many seals were seen. The moose, although plentiful at Igloolik, are never seen here. Polar bears rarely frequent this country.

On Monday, the 31st, good-bye was said to the natives, and a start was made for cape Hallowell. It could not be approached any nearer than some 4 or 5 miles on account of the accumulation of ice on its steep shores. On the 1st of November, All Saints Day, a cairn was erected at the camping place and the following record was left in a bottle. "November 1st, 1910. Left the C.G.S. 'Arctic,' commanded "by Captain J. E. Bernier, the 10th October. This record should have been "left at cape Hallowell; having found the landing impossible on account of the ice, "this site was chosen. Leaving this morning for cape Kater. J. T. E. Lavoie,

"C. S. C. E., J. E. Mathe, Geologist." As well as leaving this record, a Union Jack was hoisted and a board was made secure at the base with "'Arctic,' 1910" on the one side and "Capt. J. E. Bernier, Commander," on the other. The names of Messrs. Lavoie and Mathe, with the date, were added. Three miles north of the cairn a strip of land projecting to the west forms two small bays; one opening on the north and the other on the south, the latter being the larger, being one mile deep by a mile in width. In honor of the day Mr. Lavoie gave it the name of All Saints' cove. The following day an immense plain, bleak, dreary and bare, was seen and was named Plain of the Departed. Here, Mr. Lavoie decided to retrace his steps, Prince Regent inlet being opened and the ice on the shores being too rough and uneven to continue the journey to cape Kater, as at first intended.

An incident of note, on the return journey, occurred. Two Eskimo youths of 18 to 20 years attacked 3 polar bears. Having no rifles they got to within 10 feet of them and, goaded by the dogs, the infuriated animals became an easy prey to the calm and cool natives, who killed them with harpoons.

The men were killing seals to feed the dogs, and on stormy days, when travelling was made impossible by the flying snow, repairs were made to sleds and harness. Ice was, at times, very hard to travel on, and more than once dogs, sleds and men were upset into crevices, where great difficulty was experienced in getting them out.

The "Arctic" was reached on Thursday, the 17th, after travelling for 37 days and having covered more than 580 miles, going and coming. Sketches of the interior of the country, for 55 miles, were made. An exploration of the extreme south of Admiralty inlet was undertaken and completed. The east shore of Prince Regent inlet was followed for about 60 miles. The season being so far advanced and the sun visible only for a short time, the distances are mostly approximate.

ESKIMOS MET DURING MR. LAVOIE'S FIRST TRIP.

Heads of family		Agoo.	Children	
Amawalik	Outoukoutou	Mala (g.)		
Akawap	Powla			
Sigailto	Anouterchewang	Irrarach-o	Atouctalé	Aterjewan
Nassa	Anouactian	Outouarchjune	Kaktouragnou	
Anouteaggne (Widow)	Nateracpin			
	Aggléieu			
Cowna	Maiaretou (g.)			
Pania				
Ignouara	Outakoutou (g.)	Sigailto (b.)	Pictalo (g.)	
Irggnane				
Sirepapiagne (Widow)	Aguagnou (b.)	Actouargnon (b.)		
Ignouara	Piiwactou (g.)			
Illoupaligne				
Artetan	A child			
Aggnowhesang				
Iggnejian				
Kounou				

Ivisarocto. Lake Tascil.

Camaille	Octagavon (Widow).
Toukétagué	
Ourouiaggnan	Toupégnan (b.) Kadlou and two other children.
Ouctang	
Kouticoutou (Widow).	Siagoulou (g.)

Kooke. Lake Sapouting.

Oké	Kaioucharchouctan (b.).
Oouiarccian	
Ivielle'	
Oukéléagagne	
Ictoureligan	
Oukagnouna	

Opposite the name of the wife of each head of family, the names of their sons' wives are given. Mr. Lavoie reports that he was unable to get all of the children's names. Although belonging to the same tribe, Otumjua and Ooming were away for the winter with a few families, making in all a party of some twenty members.

APPENDIX No. 2.

REPORT OF EXPLORATION THROUGH BRODEUR PENINSULA, SURVEYS OF PRINCE REGENT INLET AND SOUTH END OF ADMIRALTY INLET, BAFFIN ISLAND, BY J. T. E. LAVOIE, C.E., ABRIDGED.



J. T. E. Lavoie leaving for Prince Regent Inlet Coast Survey, March 15th, 1911.

Wednesday, March the 15th, 1911.—Following the instructions given a few days ago, I left the "Arctic" at 8.30 this morning, with Koudnou as guide and dog

driver. Proumictou and his wife, in charge of a relief sleigh, were to accompany me as long as they were needed. At 9 we were at Oulouksigne, where we stopped for dogs' food and to refix our loads, part of which was transferred to two other Eskimos who were leaving on a bear hunt expedition and had to cross Brodeur peninsula with us. At 11 a.m. we said a last au revoir to those who had come as far as the Eskimo village with us, and we headed for Cunningham point. At 4.30 p.m. we were alongside the small islands near this point where we halted for the night. We took possession of an abandoned snow hut and made preparations for our first night's rest. The day had been cold, 26° below zero, the wind from the north and the snow drifting. As I had acquired experience in my expedition of last fall, I had decided to run this one on an entirely different principle and adopted the Eskimo ways of travelling, clothing, sleeping, etc. Being used to this country they cannot but be more practical than we in these matters. Therefore, on leaving the "Arctic" I had discarded all European clothes and dressed



Eskimo Stone and Snow House, Arctic Bay, 1910-11.

in a double skin suit. The inner one, with the hair worn next to the flesh, was covered with a more ample one, hair outside. All my body, and even my feet, were thus covered. As the couletangs fall over the pants, Chinese fashion, on a windy day it is rather uncomfortable, but it keeps the skin from getting wet when walking. My head was covered in similar fashion by the hoods attached to the couletangs. Woollen goods are useless and unhealthy, as they get damp from the body's moisture, then freeze and cannot be dried. Every night we built an igloo (snow hut) of blocks of snow. Although it took us an hour every night, it was preferable to pitching a tent, and more comfortable, as it kept the wind out. Our fuel being limited, I decided to cook but two meals a day, in case my gasoline would give out before my return. I got used from the first to eat raw meat, either caribou, bear, or seal; I got so used to it that I found as much delight as the natives in sitting on the ice immediately after a seal had been killed, to eat its liver with blubber before it had lost its animal heat. The taste, when acquired, is fine. This might seem disgusting to some, but Arctic explorers have to put up with it.

From the ship I had taken as little provisions as possible, so as not to impede our progress. These consisted mainly of sailor biscuit, tea, coffee, sugar, molasses, milk, and a few sides of bacon. To feed our dogs and ourselves we depended mostly on our guns. I was well ammunitioned, and did not forget tobacco for my companions. I used two blankets with hair on one side. One was placed on the snow and the other over me. The outer garments were always taken off outside the igloos and spread in the cold, the inner were taken off inside, and when damp had also to be spread out to be dried by the cold. The only clothes I wore in sleeping were my blankets; it is the best way to be comfortable during the day and not feel chilly. It is also the only way to keep partly clean. Getting up in the morning was fearful. As a rule we kept two Eskimo lamps burning during the night.

Thursday, March the 16th.—Thermometer at 7 o'clock this morning read 18° below; barometer at 8 a.m., $29.42''$. Weather partly fine, no wind, but rather foggy. On leaving our igloo this morning I noticed another act of our dogs. They were all sitting around our hut and gazing intently at it. As the last person came out, the whole pack, 24 of them, made a wild rush through the small opening and filled the hut. By noticing, they knew that some bones or crumbs had been left by us. The noise they made, snarling, howling and fighting, was far from musical. This was repeated every morning. No human power could restrain them, and they dashed in when all harnessed, tangling the traces. They easily disentangled, as every one of them is attached to the komatik by a single trace with a ring passed through a rope tied to the sleigh. What these dogs can and cannot eat has always been a surprise to me. Every night all our clothes and their harnesses had to be put in a safe place, or the next morning we might have awoke and found ourselves minus our pants or our boots. We broke camp at 11 in the morning and kept going till 6 p.m. in a $S. 66^{\circ} W.$ course, leading us to a small bay and large ravine on the west shore of Admiralty inlet; the ice across was good, so that we kept at a good pace, notwithstanding our heavy loads. At 2.30 p.m., I noticed two mock suns at right angles with the sun, and crossed by an arc, its lower portion below the horizon. At 4 p.m. the upper part of the circle had disappeared, leaving but two slanting columns with rainbow colours. Barometer at 10 p.m. read $29^{\circ}.96''$. Thermometer at 10 p.m. read 28° . Night intensely cold.

Friday, March the 17th, 1911.—At 9.30 this morning the thermometer read 30° and the barometer $29.70''$. At noon we broke camp, the thermometer registering 24° below zero. The direction followed was $S. 67^{\circ} W.$ for twelve miles, through a narrow canyon with perpendicular walls, averaging 100 feet in height. No contrasts were noticed. Six miles from the coast I noticed a ravine stretching from the north. At 6 p.m., as the sun was setting, we stopped for the night and built our snow houses. The mercury then read 16° below zero. A few hours later the wind veered from north to south, beginning a raging snowstorm. Our height above sea level was 400 feet. At 11 p.m. the barometer read $29.26''$. Outoucoutou, an Eskimo of Igloodik, came up to us during the night on his way to Prince Regent inlet. The sleighing was very hard, as the snow was everywhere covered with sand blown from the plateau. In some places we had to work over broken stones, the snow having all drifted. From 10 a.m. to 3 p.m. to-day I noticed a splendid display of a perihelion. At first two mock suns only were visible at right angles with the sun and parallel with the horizon. A bright halo, red, yellow and green, formed itself, its lower limb disappearing below the horizon. A third mock sun appeared above the true sun, another semi-circular halo, yellow, red and purple, intersected the first one when the mock sun appeared. Semi-circular arcs of yellow, red and green formed themselves, intersecting the two mock suns parallel with the true. Bright rays were spreading in every direction, both from the sun and the three mock suns. The colours were bright and showing advantageously at the horizon.

Saturday, March the 18th, 1911.—This morning a very strong wind blew from the S.E. with blinding snowstorm. It was impossible to proceed and we therefore stayed inside our igloo. At noon the temperature was 13° below zero, and kept steadily rising till it reached its maximum of 3° above at 8 p.m. At noon the barometer read 28.72" and reached its maximum at 8 p.m., with a pressure of 28.53". The temperature inside our snow hut rose to 54° through the heat given by our two Eskimo lamps. It then began to give way and we had to put a new roof on.

Sunday, March the 19th, 1911.—7.40 in the morning the barometer read 29.71". At 8.00 the thermometer registered 18° below zero, and 10 below at noon. At 11.30 a.m. we broke camp, direction followed was N. 58° W. for a distance of 15 miles, when we halted for the night. At this point we were 660 feet higher than in the morning. At 5 p.m. we were on an immense wind-swept table-land, a barren desert without any sign of vegetation. The dogs had to be led zig-zag from one snow bank to the other, wherever a small depression existed. Different from other parts of the country, there is neither lake nor river in the interior, but only small ravines running into the one we have followed so far. At 5 p.m., the barometer read 28.06". At 6.30 p.m. we stopped for the night on a large plateau sinking gradually east and west. The day being St. Joseph's Day, I called it St. Joseph's Plateau. The desolate and barren scenes around were relieved by a very animated scene when we halted for the night. The caravan comprised five komatiks, drawn by 56 dogs, seven men, six women and three children. A temporary village of five huts is built every evening in two hours' time. Whilst the children play and romp, the dogs howl, fight, or try to tear out and eat anything that lies close to them. They are the cause of our late departures in the morning, as we have to unload our provisions every evening and hide them in a snow fortress. We tried tying the dogs at night, but when we were wrapt in slumber they would eat their harness and attack our provisions on the sleigh. Dogs are indispensable for travelling in the North, but although affectionate they are a continual cause of annoyance.

Monday, March the 20th, 1911.—In the morning we woke to find out that another monotonous day had to elapse before we could proceed. A heavy N.W. wind, blowing at a rate of twenty miles an hour, accompanied with snow and a temperature of 23 below zero, was impossible to face. I made the attempt several times, but gave it up in disgust and returned to our igloo. The dogs themselves were uncontrollable, and none of the natives felt inclined to budge; the barometer was stationary at 28.25". In the course of the day, Okey overtook us, with his wife and a child, coming from Moffet bay. They were entirely exhausted, and had been severely frost bitten on their faces and hands. I revived them with hot coffee and was many times thanked and blessed for my kindness. Pieta, piiouk cablouna, couianaming, etc.

Tuesday, March the 21st, 1911.—The thermometer at 8 a.m. read 28° , reaching its maximum after twelve, the barometer registering 28.55". From 10.30 a.m. till noon we followed a due south course, covering a distance of 6 miles. We then changed to S. 41° W. for eleven miles to S. 56° W. for three miles, and to S. 41° W. for another $4\frac{1}{2}$ miles. The valley which we are following is so tortuous that between the two last named directions we covered $1\frac{1}{2}$ miles in S. 10° E. direction. On account of yesterday's snow, the sleighing was much better, enabling us to cover 26 geographical miles. We were then at an altitude of 980 feet above sea level. This part of the country is entirely composed of greyish limestones, finely broken and without traces of any fossils. We had a very fine day in all respects. From 9.15 a.m. to 10.30 a.m. two brilliant mock suns, with circular arcs of intense purple, yellow and red hues, were visible, the lower part of the circle disappearing below the horizon. At 6 p.m. the thermometer registered 26.5° below zero, and the barometer 28.89". At 10 p.m. an accident befell us and quite incongruous it was. Our snow hut was on fire. This is how it happened.

The small gasoline stove had proven so far a great bore and test to my patience. Every night it took me three-quarters of an hour before I could make it generate its gas. Then after a few minutes it would spurt and start to flame, so that every time I had to pour alcohol in the heater to start it afresh. I came to the conclusion that some dirt had found its way into the conduit. My guide Koudnou, who was very clever, had seen me two days before take it to pieces and clean it. This night it happened that it was worse than ever, and as soon as I had gone to bed it occurred to him that he might fix it there, for he sat near an Eskimo lamp. He took his wrench and unscrewed the first part. Unluckily before doing so, he had forgotten to let out the air that was pumped into the reservoir to press out the gasoline. A stream about $\frac{1}{8}$ of an inch came squirting out right over the native's lighted lamp. Naturally it caught fire and spread over us as Koudnou was trying to stop it, setting our blankets and clothes on fire. The flames partly blinded us. With a savage yell, Pioumictou drove through the wall of our igloo; of course I had to follow. Just think of the discomfort of a man, his blankets burning and having to escape through a wall of snow with no clothes on, and the thermometer at 30° below zero with a fresh northerly wind. Koudnou bravely remained inside the hut. Whilst the wall was repaired with new blocks of snow I wrapped myself in a spare caribou skin and waited about ten minutes on a snow bank for the repairs to be completed. I found out later that the reason why my stove gave me such poor service was the intense cold; as in May it worked splendidly.

Wednesday, March the 22nd, 1911.—At 9 a.m. the thermometer registered 22° below zero. At noon it read 19.5 below, and 29.5 below at 6.30 p.m. The barometer fell from 28.91" to 28.66" at 11 p.m., wind blowing from the north. We left camp this morning at 11 o'clock, and kept steadily at it till 6 at night. The first six miles we made S. 35° W., turning to due east for the last 15 miles of our day's tramp. The height above sea level was 1200 feet. The gasoline stove renewed its pranks and nearly drove me mad. I was somewhat exhausted, cold and famished, our supper being only ready at 11 p.m., the interval between our two meals being 14 hours. At 1 p.m., I tried to eat a piece of raw caribou, but it was frozen so hard that my teeth were not able to chew it.

Thursday, March the 23rd, 1911.—At 10.30 a.m. the barometer registered 28.61" of pressure, the thermometer rising to 23° above zero at noon. The wind kept blowing steadily from the north. We spent the day in the igloo repairing the damage done by the fire on the night of the 21st. A pair of pants, two pairs of stockings, one pair of mittens and different repairs to my blankets were made. The Eskimo women proved very useful in this emergency. This work, as also that of lighting and trimming the lamps, is so essentially feminine, that not one man could lower himself to do it. Nothing mortifies an Eskimo as much as to surprise him in the act of trimming his lamp, which is in itself an art. I could never get those I had with me do it as it would be derogatory to their standing. In the course of the winter I had a striking example of this. I called one day on old Nassau in his igloo. His cooney had been out for two hours and so had her lamp. Instead of relighting it he waited patiently on his bed for another hour, when she returned. In the meantime the temperature in the hut had fallen to 10° below zero. As far as I could understand, these habits are based on legends and superstition.

Friday, March the 24th, 1911.—The atmospheric pressure at 8 o'clock this morning stood at 28.78", the thermometer at 8 indicating 32° below zero. We resumed our journey at 11 a.m., following the course of W. 87°, 30 N. At 4 p.m. we left the large undulating plateau on which we had travelled the last days, and struck through a ravine with a drop of 500 feet at its head and running nearly due west for seven miles, finishing in a kind of oval basin of 5 miles by three, and surrounded by limestone mountains ranging from 600 to 700 feet in altitude. Three peaks a hundred feet higher rise from their summits, one to the east, one to the north, and one to the south west, which I thought must be Mount Sherer. The two

others I respectively called Mount Lee and Mount Arthur, after my two brothers. At night I felt a longing for home and the picturesque hills and mountains of western Baie des Chaleurs, my own home. We had covered over 28 miles during the day and were glad to call halt at 7.30 p.m. I came to the conclusion that we could not be very far from Prince Regent strait, as our altitude was only 295 feet above sea level. It was time to be there, as the country we had crossed is entirely void of game, and we had to replenish our larder and our dogs.

The maximum temperature registered was 29° below zero at noon. At 8 p.m. it had fallen to 35° below, the barometer reading 29.64". House building and the manipulating of the stove, bare handed, in this climate are not what one might term "picnic fun."

Saturday, March the 25th, 1911.—At 10 o'clock a.m. the thermometer gave us 34° below zero, with a most beautiful calm and sunny day. It rose to 29° below at noon and gradually fell until at 8 p.m. it read 39° , the barometer ranging between 29.69" and 29.75". We left on our journey at noon in a W. $67^{\circ} 30''$ N. course for $6\frac{3}{4}$ miles, taking us to the bottom of Port Bowen. At 4 p.m. we were rounding its southern point. The travelling here was very difficult, owing to the ice pressure at the entrance of the bay. The capes surrounding it are entirely composed of secondary limestone, indicated by numerous fossils they contain. They average from 350 to 500 feet in height. At 4.30 p.m. we halted for the night and a day or two, for my men to procure dog food. In our course across Brodeur peninsula we had covered $108\frac{3}{4}$ geographical miles (125.22 statute miles) in 6 days, an average of 18 miles a day, or 20.87.

Sunday, March the 26th, 1911.—The thermometer read 32° below zero, rising to 12° below at noon, the barometer at 10 a.m. indicating 29.98". By a mid-day observation, I found out that I was two miles south of Port Bowen.

Monday, March the 27th, 1911.—I was exploring the interior of the country. On some of the limestone blocks I discovered numerous and very fine fossils. They were so strongly embedded in the rocks that I could only collect a few poor specimens. Not far from our camping place, I found on the sand part of the back bone of a whale.

Tuesday, March the 28th, 1911.—We had just got up in the morning when a clamour broke the air. It was the repeated cries of nanouk (a bear). It was within 500 yards of our camp and was shot by an Eskimo. This part of the strait is literally covered with their tracks. My Eskimos were so keen about killing one that I gave them two days to satisfy their craving. In the course of the day I went over part of the strait and examined the ice conditions. There is a fine ledge for sleighing along the shore, but towards the middle it is all broken and piled together. It is the usual resort of the polar bears. They feel perfectly at home there, for neither men nor dogs can follow them. Every one we came across during my expedition always sought refuge in that mass of broken ice. I returned to camp a little ahead of my hunters who returned empty-handed. At 10 p.m. a brilliant aurora borealis appeared in the south east. It diffused a bright white light in long wide streaks on the hummocks while the northern horizon was covered with stratus clouds of vivid purple and dark green colours.

Wednesday, March the 29th, 1911.—This being the last day given to my two men they left early, bound to kill something. They returned at 8 p.m. with a seal. Two Eskimo families left us to-day to get across Prince Regent inlet to land on north Somerset. I made another trip in the interior but failed to discover anything of interest.

Thursday, March the 30th, 1911.—I resumed my work and I started for cape Kater at noon, bidding au-revoir to the remaining three Eskimo families that had crossed Brodeur peninsula with me. Those that helped me to take across part of our provisions were paid with tobacco. The day was fine with an easterly wind. We covered a distance of 17 miles, in some places over very bad ice. Between port Neil and mount Sherer part of the capes are castellated with an elevation of about 500 feet above sea level.



Seal Hunting Apparatus.

Friday, March the 31st, 1911.—At 7 a.m. we broke camp, heading due south, and kept plodding until seven p.m., covering a distance of 16 miles. We camped off the southern point of Macbean bay. The ice over which we travelled was very bad, pressed and all broken in pieces of different sizes, cemented together by new ice. We even had difficulty in finding a place to build our igloo. As we got further south the coast decreases steadily and is hardly three hundred feet in height in Macbean bay.

Saturday, April the 1st, 1911.—At 8 in the morning the thermometer read 21.0° below zero, rising to 2° below at noon, the barometer indicating 30.38". Exposed directly to the sun's rays and in a sheltered spot the mercury rose to 12° . In the forenoon a bear was seen and captured by my men for dog food. This delayed our departure until 2.30 p.m. We followed close to the shore on very bad ice, covering but 5 miles in a southerly course.

Sunday, April 2nd, 1911.—The maximum temperature was 11.5° , barometer 10 a.m. 29.96". Fine and sunny day with calm weather, sky of a far away deep blue. We kept the Sabbath holy. Koudnou and Pioumictoo went hunting. In the evening the sun set in an ocean of purple clouds of various and fantastic forms.

Monday, April the 3rd, 1911.—We broke camp at noon, keeping a southerly course till 7.10 p.m., covering a distance of 12.6 miles. The ice on this part of the coast was frozen into fantastic shapes. It is exhausting to travel over such rough ground.

Tuesday, April 4th, 1911.—At 9 a.m. the thermometer registered 26° , reaching its maximum at 11° . Barometer at 10 a.m. read 29.37" with a strong S.E. wind. We left our hut at 11.30 a.m. We had hardly covered a mile when I noticed a large male bear following us within a hundred yards, immediately the dogs were let loose and rushed at him cutting off his retreat. He made a bold stand, and very interesting it was for me to see him trying to get rid of the dogs. Koudnou eventually shot him through the head from a distance of fifty feet. Two dogs were badly hurt by the bear in the fray, one had all his hind leg chewed and was useless for the rest of the trip. The skinning and stripping of the meat and dog feeding delayed us so much that we slept in yesterday's igloo.

Wednesday, April 5th, 1911.—As I expected to be in the vicinity of cape Kater, whence I had to survey the coast to cape Hallowell, I decided to remain here and take a set of observations to work from. These placed me in latitude $72^{\circ} 25' 20''$ N. by longitude $90^{\circ} 08' 50''$ W., a few miles N. by W. of cape Kaye. The atmosphere was hazy and calm, fine snow falling.

Thursday, April 6th, 1911.—We left camp in the morning at 11, heading towards cape Kaye. At 3 p.m. we rested a quarter of an hour on the point that advances from it, and kept on in a S. 34° E. course, covering a distance of fifteen miles. At 5.15 p.m. a bear and its cub were seen by the natives. They hurriedly threw off the loads and off we were in hot pursuit. We had only the excitement of the chase, for the animal took her cub into an impenetrable mass of broken ice where even the dogs could not follow.

Friday, April 7th, 1911.—The day was bright and clear, the thermometer rising to 4° above zero at noon, but falling rapidly to 35° below at 10 o'clock in the evening. The barometer kept steadily at 29.948". At 11.30 in the morning we broke camp and kept travelling till 7.30 p.m., when we halted for the night a few miles south of cape Kater, which lies in latitude $71^{\circ} 55'$ N., longitude $90^{\circ} 05'$ W. Although the ice afforded very poor going the whole way through in Fitzgerald bay, yet we managed to cover 24 miles. My progress was somewhat impeded by my Eskimos. This part of the strait is literally covered with bear tracks, and whenever we came across any fresh ones off they went on the chase at a moment's notice. I had to be careful to make them follow the coast, otherwise they would zigzag across the strait with the loads.

Saturday, April 8th, 1911.—We left cape Kater at 9.20 in the morning, taking a S. 34° E. course, covering a distance of 23.3 miles. At 4.30 p.m. we stopped on a low sandy point, 21 miles south of cape Kater and forming a long bay running S. 60° E. We built our igloo on this point, two miles from its extremity, where it turns to the south. In rechecking my observations and notes I found out that this newly discovered bay was 101 miles south of Port Bowen in a direct line. To-morrow I intend to make a thorough survey of it. At 10 p.m. we had our usual supper of boiled bear meat. It was something of a routine since we came to Prince Regent and our menus have invariably been: bear meat, fried in its own fat for breakfast, boiled for the other two meals; an occasional seal's liver was served to vary the monotony. Biscuits and coffee were partaken of when in camp, while marmalade comprised the dessert.

I set to work at noon on the ninth, taking observations, and found the latitude where we camped last to be $71^{\circ} 27' 35''$ N. and my longitude by chronometer $89^{\circ} 22' 40''$ W. The first part of the point, 3 miles long, bears N. 5° W. from my observation point. Looking to the south it runs S. 12° W. for one mile, turning to S. 75° E. for six miles. The bay formed by this point looks very shallow from the small bergs aground in it and the very low elevation of its shores, which are but 30 feet high 2 miles inland. In those explorations I found ancient beaches of recent formation. The first about $\frac{1}{2}$ a mile from the actual shore was but ten feet above the actual sea level, as shown by cross section.

It is very nigh impossible to take accurate angles of the coast more than $\frac{1}{4}$ of a mile from it, as it looks uniform with the ice. The geological formation is the same as exists all along this coast. The limestones and fossils collected were similar to those between latitude 72° and 73° N. While taking my observations and making a thorough survey of this, which I named Bourassa bay after our great Canadian orator, Koudnoo and Piomietoo went seal hunting. An unusual incident occurred to-day as I was preparing to take the sun's altitude. In raising my eyes I saw a splendid Polar bear advancing cautiously towards me, and at hardly fifty feet distance. I had not seen it before, as it crossed from the bay behind me, over the point. I just dropped my sextant, went in our igloo and came out with a No. 12 shot gun, hid behind a large stone and stood ready to shoot at its face when it would be at close range. It was all I could do, as my men had taken

the two rifles with them on going out in the morning. Happily for me, the lame dog had remained with me. My movements roused the dog's attention, and on seeing the bear he began to shiver with fear and howled most dismally. The bear turned and ran away, to my personal relief and probably for its own safety. At 5 p.m. Koudnoo and his associates returned to the camp. They had killed a she-bear and her cub.

Monday, April the 10th, 1911.—I finished surveying this part of the coast. Before leaving the ship I had been told to build a cairn on cape Kater. It struck me that I had entirely forgotten it. As it was too far to go back there, I decided to place it on the point near which we were camping. After three hours' hard labour it was completed, with a four feet base and five feet high. As the stones were solidly frozen to the ground it was the best we could do. From this point, which I called Leah point, after one of my sisters, who died during my expedition in the north. Cape Kater was bearing N. 23° W.; mount Senecal, a small circular elevation, N. 35° E.; and our camp S. 24° E., the bay running S. 60° E. At 5 p.m., although the mercury showed but 5° , I suffered intensely from the cold, which I attributed to the damp atmosphere and chilly wind. From 2 p.m. the skies were overcast and foggy. At 7 p.m. the barometer read 30.398".

Tuesday, April the 11th, 1911.—The day was stormy. Aeolus must have given a holiday to his followers. The skies and the earth were but confused masses to our view, the wind raged, driving the snow in clouds before it. These northern storms are grand. Naturally, it is impossible to proceed in such weather. We, therefore, slept to our hearts' content. At 4 p.m. the wind began abating. A remarkable fact is that my barometer did not fall below 30° , as at 4 p.m. it still read 30.07".

The greater part of the day was employed in a general overhaul, and fixing of our footgear and the dogs' harnesses. Our igloo was quite comfortable with a temperature ranging from 25° to 30° above zero.

Wednesday, April the 12th, 1911.—We broke camp at 9 a.m., following a S. 75° E. course for four miles. We then turned to S. 23° E. for 9.2 miles, taking us to a low point north of a bay, running S. 80° E., at 1.50 p.m. This point is about three miles long, very low, and of finely broken limestone. The ice had been pressed against the land, and was very rough to travel over. This bay being the most important discovery on this coast, I named it Bernier bay, after the Commander of the "Arctic." Its north point I called Morin point, after the First Officer, and its southern point Van Koenig, after the First Engineer. Three capes are situated on its northern shore. These I named Janes and McDonald capes, Second and Third Officers, the last bearing our Doctor's name, Bolduc cape; to the low island at its entrance I give my own name. The first part of the bay from the extremity of Morin point bears S. 80° E. for six miles, turning to S. 19° E. for half a mile, and then to S. 72° E. for 4.5 miles. Half-way in the last course, Janes cape was due north. At N. 12° E. is a ravine separating it from McDonald cape. These capes are about 150 feet high and three miles from the seashore. They are seen from a long distance on account of the low lying country around the bay. From our last course the shore runs east for four miles, and S.E. for 8.4 miles. From 5 to 6 p.m. we went by S. 10° E., where we halted for the night, covering a last distance of 5.1 miles, placing us in latitude $71^{\circ}.03'$ N. and longitude $87^{\circ} 36' 30''$ W. From this point the ravine between Janes and MacDonald capes was bearing N.W., cape Bolduc, N. 18° W., and the ravine east of it N. 12° E. A small low point was at an angle of N. 53° E., inland in S. 47° E., and a third ravine N. 30° E., whilst the bay itself continued inland S. 47° E. for about five miles, where the river empties into it. We were just in the act of building our igloo at night when Koudnoo saw in an easterly direction a she-bear with two cubs; they were about one mile off. I strapped my kodak on one of the komatiks, we set the dogs on the scent, and we started in hot pursuit. The dogs in these cases get literally crazy, flying over the ice. It was all we could do to hold the komatiks.

When within $\frac{1}{4}$ of a mile from the animals, the two leaders' traces were unhooked, and to them was given the difficult task of stopping the animals. The way they act is surprising. Dashing at the bear, one of them bites its hind leg, the bear turning on it and trying to catch it. The other leader attracts the bear's attention in biting again its hind paw. This game is kept up till the other dogs arrive and help them. The leaders used in this case are always bitches, as the dogs alone are cowards. Our other fifteen dogs, all harnessed, got rapidly nearer, and when about 50 feet from the she-bear we just rolled off our komatiks. She put up a splendid fight, looking after her cubs that were the cause of her downfall. I missed the opportunity of a fine snapshot, but my kodak tied on the sleigh was inaccessible as the bear was all tangled up in the traces, and with the dogs holding on to her was as often on the komatik as off. She was finally despatched with three rifle shots, and the cubs strangled. The dogs ate ravenously and so much that it was all they could do to draw us back with the carcasses. One of them had been badly hurt and we had to take him back on the komatik. It was nine p.m. before we reached our camping place, and midnight before our igloo was built and our supper ready. I cooked one of the cubs. The flesh was tender and delicious. Our appetites were keen, as we had not eaten since 7 o'clock in the morning. The maximum temperature registered was 4.8° above zero, snow drifting and the sky overcast part of the day.

Thursday, April 13th, 1911.—I felt the change of the temperature so much that I worked bareheaded and barehanded. We left this place at half-past twelve, taking a south west course for 6.7 miles, then turning to due west for 10.9 miles, taking us within a mile from the end of Van Koenig point, on the south entrance of Bernier bay. This point is three miles long, and from 10 to 15 feet above the sea level, composed of mixed finely broken limestone boulders. It runs to N. 80° W., and has a very small low island at its extremity. It was 6 p.m. when we came to it and we decided to spend the night there. All the afternoon the moisture-laden wind blew from the east. The clouds were low and hazy, intercepting the sun's rays. Whilst building our snow hut, we saw a bear some distance on the bay; as we had enough dogs' food for the present I stopped my Eskimos from chasing it. At 8 p.m. the thermometer read 10° below zero, the wind increasing in velocity. At midnight, when ready to sleep, the dogs gave us a start in getting on the scent of a bear that came prowling around our huts, and chasing him. Koudnoo and Poomietoo, half-dressed, had to hurry after them to call them back and keep them from being devoured or running astray. In the interval a storm had broken out.

Friday, April 14th, 1911.—Poomietoo and Koudnoo returned from reassembling their dogs at 2 a.m. One of the former's best ones, both for hauling and bear hunting, was not found nor answered his master's call. Poomietoo stoically explained that Kigmeng poilomit nanook tigligpook his dog, had been stolen by the bear. During their absence a fearful snowstorm had broken, obliterating every landmark. It was with difficulty that they found our hut. I woke up at noon. Outside, I could hear the wind roaring. The snow had been drifted into our igloo. A coating two inches thick lay over our blankets. My gasoline stove and our provisions, which I had placed near the entrance, had to be dug out. After lunch, to go outside we had to open our igloo at the top. It was literally buried in snow banks. The wind was blowing at a rate of about 75 miles an hour, with snow. Nothing was visible at a few feet distant from us, and it was all we could do to stand up in the storm. I helped my Eskimo to dig the dogs from the snow. They had to be looked after in such weather, as they are liable to smother without a move or a howl. It was useless to open the low entrance of our snow house, therefore we re-entered it by the top, closing it with a new block of snow. No fire was made in the hut, and we ate but cold raw meat. At 9 p.m. the barometer had only fallen to $29.82''$, the storm increasing in violence. It was of tremendous force, with the wind from the east.

Saturday, April 15th, 1911.—Yesterday's tempest has increased in violence and strength. It is worse than I could have pictured in imagination. I am just thinking how lucky we have been to camp on terra firma. What would have happened if we were in the middle of the strait. Barometer at noon read 29.50". In the afternoon we had to use the same means of going out as yesterday, and look after our four-footed friends. At 6 p.m. there was a lull in the weather; the snow had stopped, but the wind, which had veered from east to south during the night, was still raging. In looking towards our last camping place on the bay I trembled: there was no more ice, but a stretch of blue water four miles long by about two wide. At 7 p.m. the barometer read 29.57", the wind blowing a gale. Our igloo, cheerless and fireless, with a temperature ranging from 24° to 29° above zero. It was too windy to keep our Eskimo lamps in trim and my gasoline was limited. Snow water and raw bear meat composed our meals. Next day our komatiks, provisions, spare clothes and dog harness were buried under five feet of wind-packed snow. We worked part of the forenoon to dig them out. Towards 4 p.m. I walked to the end of Van Koenig point. From west to N. W. Prince Regent strait was open for about seven miles. I could not ascertain the width, as the water was seen as far as the eye could see. At about 5 p.m. Koudnoo and Poomictoo harnessed their dogs and went near this open space to try and catch a few seals. During their absence a violent snowstorm broke out, lasting half an hour. It was the last spasms of the dying tempest. They returned at seven with a bear shot by Poomictoo. At 5 p.m. the thermometer registered 20° and the barometer had quickly risen to 29.928".

Over a month had elapsed since I left the "Arctic," and I had not yet reached cape Hallowell, although my time had been fully employed. My Eskimos were grumbling for two days and inclined to go back. This I attributed to the fact that they never travelled over this country, and they are always unwilling to go through unknown land. They cannot understand that I can direct them with the sun or the stars, although I often surprised them in giving them directions to go to a certain spot which we invariably struck. At 11 a.m., the thermometer registered 31° above zero and 51° exposed to the sun's rays. It was an ideal day, and I felt comfortable sitting on a snow bank to write and check my notes. At noon the barometer read 30.252", when the sky began to cloud. With my sextant and artificial horizon I took a full set of observations placing me in latitude 71° 04' 42" N., longitude 88° 26' 24" W. From this spot the point bears N. 80° W. and runs out two more miles, and due east looking backwards. I then measured one mile going S. 44° W. taking me across this point. I then set up my true compass and took the following angles of a small bay south of Van Koenig point. This I called Thibault cove. Its angles read thus: its southern extremity S. 60° 15' E., distance 5.8 miles, turning gradually to S. 48° 30' W. and S. 60° W. A cape 120 feet high and 6 miles long was at S. 29° E. This elevation I called Easter cape. It is all formed of limestone with fossils. I then walked to the extremity of Van Koenig point and examined the sand bank lying close to its end. It is but a few feet above sea level and was very likely detached from the point itself by the ice pressure which is very great here, as shown by its piling in great masses. It is formed of gravel, sand and large boulders. From the end of this point, Easter cape bears S. 63° E. and my back-sight S. 71° E. More to the south, I presumed that the coast ran S. 27° E., this I shall be able to ascertain as I go further south. At 3.20 p.m. the thermometer read 31.5° above zero, weather calm with a blue sky striped with stratus clouds hanging close to the horizon.

Tuesday, April 18th, 1911.—The maximum temperature registered was 21.7°, the barometer read 30.46". We made our way to Bernier bay, covering a distance of four miles from noon to 9 p.m., over exceedingly rough ice and pitched our tent on Prince Regent strait.

Wednesday, April 19th, 1911.—In getting up in the morning, I noticed a fissure 6 inches wide through the ice, which was six feet thick, passing right underneath our beds and running diagonally to an open water space, one quarter of a

mile from our tent. Luckily for us that the weather was calm as we very likely would have had a cold bath or would have gone adrift in the strait on an ice field. The clouds kept low and foggy till 10 a.m., when out came the glorious sun. At 11.20 a.m. we resumed our journey, covering the following distances: 2 miles S. 35° E., 6 miles S. 36° E., 4.4 miles S. 26° E., 12 miles S. 21° E. The coast is flat and very low. From our starting point, a slight elevation, miles inland, was seen at an angle of S. 47° E. In changing my course from S. 26° to S. 21° E., this elevation was bearing S. 76° E. to E. 20° N. and the land which we had covered, N. 31° W. At 5.20 p.m. we met a bear, the dogs starting in hot pursuit, but the animal ran to safety in a field of broken and piled up ice, the whole of Prince Regent strait being filled with ice in a similar state.

I passed a very poor night, feeling cold, tired and sleepy. The monotony of the voyage told on me. We left camp this morning at 9.35, going S. 35° E. for three miles, when we crossed the extremity of a low sandy point running southwest, followed $\frac{1}{2}$ mile with another similar $2\frac{1}{2}$ miles, further in a S. 44° 40' E. direction there is a small hill bearing E. 10° 30' N. This angle was taken 1000' feet from the shore and the next one 1.3 miles more to the south. It was then bearing N.W. From noon to 6.05 p.m., when we halted for the night, we covered but 10 miles in a straight line, zig-zagging in and out of the numerous small points on this part of the coast, which direction is S. 36° E. The wind veered to S.E. during the day; it was so laden with moisture that I several times was under the impression that it was raining. As the sky was too overcast to take the sun's altitude, I had to run on my true compass angles, using prominent spots or boulders for my backsights.

Friday, April 21st, 1911.—At 9 o'clock this morning the thermometer registered 26.8°, the wind still from the S.E. but not as wet as yesterday. The barometer showed a pressure of 29.998". The sun was invisible for the whole day. Our departure was delayed till noon, as we had to change our cariboo skin boots for those of seal. The softening of these last ones is not a matter of a few minutes. We covered 6.1 miles, rounding a low headland running S.W., and resumed our course of S. 35° 45' E. for another 7.3 miles, when we stopped for the night, at 8.20, at Mathe point, visited last fall, bearing S. E. The travelling was excessively difficult, the shore line rises 25 feet in 75, then the land runs very near level a few miles inland. All along this coast the ice had been broken against the shore to a height of from 5 to 10 feet. The whole of the strait here looks to be a confusion. It is impossible to picture to oneself without seeing it the state of the ice. Of course we had to follow on the inclined beach where there was a little snow, and our progress was impeded by a number of stones. We saw two or three bears sitting on huge blocks of ice, gazing at us as we went past them. Our eyes were in a very poor state, owing to the reflection of the sun on the snow and ice, the suffering caused thereby was quite severe.

Saturday, April 22nd, 1911.—The wind veered to the east during the night and was blowing at the rate of 35 miles an hour. It was all we could do to keep our tent upright, and it was impossible to cook any breakfast. At 8 a.m. the barometer read 29.898'', the thermometer rising to 32.4° above zero, the atmosphere remaining foggy and the clouds low. My eyes were in a very poor condition, red, swollen, and looked as if they had been severely burnt. The continuous darting pains were almost intolerable. We broke camp at 11.10 a.m., but were forced to stop at 2.20 p.m. by the violence of the wind and a storm that completely threw us out of our bearings and reckonings.

Sunday, April 23rd, 1912.—The storm, instead of abating, had increased in violence. We had to pile blocks of snow around and on the tent to keep it up. It was very uncomfortable, as the snow drifted in through the door, wetting everything and preventing us from lighting our Eskimo lamps. My eyesight was just a little better, from my not having travelled.

Monday, April 24th, 1911.—The wind had been raging all the night, and there was no change in the weather. The forced rest was enervating and monotonous. In the morning the dogs found the means of stealing my three last pounds

of butter and eating three sets of harness. Poor animals ! I do not blame them, as this was their third day without a single meal. The little bear meat we had left we kept for ourselves. At 9 a.m., the barometer read 29.60". May it continue to rise. At 7 p.m. the wind fell. At 8 p.m. the barometer had risen to 29.709", the thermometer descending to 0°.

Tuesday, April 25th, 1911.—During the night a northwest wind rose and started a new storm. At noon, through a rift in the clouds I managed to take the sun's altitude: 65° 02' 00", latitude 70° 13' 53" N., longitude from chronometer 86° 57' 30" W. These observations were taken under painful conditions on account of the state of my eyes. At noon, the barometer read 29.759" and the thermometer 12°. Taking my observations for a base, I then made a triangulation of the most northern cove formed by Kimacto, as shown on my accompanying map. At 1 p.m. we broke camp, ready to battle the wind and the storm rather than remain idle. We followed the coast for 7.5 miles, changing our course to south to cross over to Hall island. About 5 p.m. we found that it was impossible to do so, as we were stopped by masses of broken piled ice. The travelling so far had been the worst we had gone through. In climbing a stranded iceberg I could see the northern end of the island, still unexplored. We retraced our steps, following a course of E. 30° 25' N., making a passage for our dogs and sledges through the chaos in which we had fallen. I am of the opinion that the passage between Kimacto and Hall islands is very shallow, which I attribute to the heavy floes of old ice that fill it and causes the new ice to break and pile through the strong current running there. At 8 p.m. we halted for the night; still a long distance from land, at 9 p.m. the thermometer registered 6.2°. At midnight the barometer stood at 29.758". The wind blew from the N.W. all day, drifting the snow in thick clouds. At night the Eskimos fed their dogs with an untanned frozen sealskin cut in small pieces; they ate ravenously, as they had not been fed since the 21st, as we had been unable to procure either a seal or a bear. A noticeable fact is that they pull better and go much faster when starved for a few days.

Wednesday, April 26th, 1911.—In the morning we found our sledges to be in a very shaky state. All the lashings were loose and some of the boards split, all requiring repairs. We broke camp at 10.30 a.m., travelling till 2.15 p.m., when we halted at the foot of cape Hallowell in a convenient sheltered spot. Here we pitched our tent for a few days, as I had some surveys to complete here and visit and triangulate Hall island in the eastern entrance of Boothia gulf. As far as I know, I was the first white man to set foot on this land. I had been unwell and restless all day, chilly and feverish, I was battling against those creeping sensations and bound to master them. At 3 p.m., Koudnoo and Piomictoo went hunting; our dogs had been then six days without eating, and we three without meat. As we did not capture any seals lately, we had no blubber to feed our lamps with, and therefore sat in the cold at night without any fire. At midnight I felt uneasy as my Eskimo had not got back to camp. Rather than to sit shivering I undressed, spread my two cariboo-skin blankets on the ice, crept in, and was soon fast asleep.

Thursday, April 27th, 1911.—At 4.45 in the morning, the barking of the dogs woke me. My men returned. They had gone across Autridge bay to the north shore of Fury and Hecla strait and had come across a herd of nine cariboo, which they shot. The dogs immediately ate three whole carcasses. The skinning and trimming of the remaining six had delayed them a few hours. We felt tired enough to sleep till nine in the morning. At noon I took a full set of solar observations, placing me a few miles north of cape Hallowell, which is in latitude 69° 57' 30" N. by longitude 85° 26' W. In the afternoon I made a thorough triangulation of Autridge bay. Its northwestern coast does not run as much inland as shown on the charts, the opening of Whyte inlet being more to the north. From this point its eastern shore runs nearly due south for five miles before turning, to continue the north shore of Fury and Hecla strait. I also took the height of the different capes

around. They range from 600 to 800 feet, are rugged and of beautiful shapes; they are mostly composed of blende with white feldspar. The atmosphere was clear enough to enable me to see land across the strait from S. 18° E. to S.E.; the first small island north of the cape Englefield bearing S. 11° W. This part of my work was finished at 8 o'clock at night.

Friday, April 28th, 1911. —The barometer at 9 a.m. read 30.102'' with northerly wind and the thermometer 3° above zero, indications of a sunny clear day. Our seventeen best dogs were harnessed to one of the sledges, and at 10 o'clock I left with Koudnoo to explore Hall island. Five miles south of cape Hallowell I took the angles of the entrance of Agoo bay. They read N. 50° W. to N. 72° W. We then headed West. At noon, I stopped for observations; I found that I was in latitude $69^{\circ} 50' N.$, longitude $86^{\circ} 39' 30''$. From this point, the island, which is very low, was bearing N. 86° W.; its southern point, which is somewhat higher, was by S. 50° E. It was 2.20 p.m. when I set foot on this island; from my latitude point we had covered a distance of 8 miles in a S. W. direction. The travelling of this last part was very poor on account of the bad state of the ice. Once on the island we went inland 4.3 miles on a southerly course, reaching the highest point of the island, 225 feet above sea level, where I took a new set of observations. Cape Hallowell was bearing N. 48° E.; the northern point of the island W. 74° N., and its southern end S. 45° E. to S. 65° E.; Encampment bay, surveyed by Hall, was at an angle of E. 10° N. on the west coast of Melville peninsula. The place where we were would have been an ideal spot to build a cairn, as I had been asked to do. Unhappily there was not a large stone to be found on the island. It is entirely composed of sand and small stones; divided in small valleys covered with grass and moss; a few tracks of reindeers were seen in one of them. On leaving we took a S. 45° E. course for 3 miles, taking us in a small bay, running S. 0° W. The island extending two more miles and ending S. 30° E. At 7.20 p.m. going S. 10° E., cape Parry, bearing east, I took another reading of Hall island, viz: N. 70° W. Encampment bay, which has an opening of seven miles, is situated between capes Englefield and Parry, two imposing bluffs of a dark gray colour. They looked majestic, their summits being crowned with purple clouds. There is also a wide valley running in the bay S. by E. $\frac{1}{2}$ E. At 8.30 p.m. I noticed a perihelium, the sun at the time being but a few degrees above the horizon. At 8 p.m. we passed between cape Englefield and the small island north of it, taking a direct course for cape Hallowell. It was 10.20 p.m. when we halted in front of our tent. The sun had been set half an hour, so that it was not very dark. The thermometer was registering 2° below zero. The dogs had been travelling at a fast rate all day, preventing us from walking, which meant that I was chilled when I entered my tent. A good hot cup of tea quickly renewed my circulation. In the twelve hours and twenty minutes that I was gone, beside the stops to enable me to make my observations, we had covered over 74 geographical miles. The dogs were pretty well played out and given two whole reindeer carcasses for their services. On the eastern shore of the island, for a width of three miles, the ice was partly composed of old ice frozen to the new. The travelling, therefore, was very rough. At its northern end it was so pressed and broken that it formed an impassable mass. On Fury and Hecla strait the conditions were very good; all the ice was new and level as far as I could see with my spy glass.

Saturday, April 29th, 1911.—The barometer at 9 a.m. was 30.110''. Maximum temperature, 14.2° . Wind from the north. In my expedition last fall, owing to fog, I had mistaken Autridge bay for Agoo. This error I have corrected this spring. At 10 a.m. I climbed cape Hallowell. It lies N. 26° W. of the point where we camped, and is about three miles inland. Its height from barometric measurements is 465 feet. The bottom of Agoo bay being an angle of N. $24^{\circ} 30' W.$, where there is a large bluff, cape Hallowell is entirely composed of small, flat, red limestone mixed with a certain amount of granitic rocks. I returned to camp at three p.m., and with the help of the Eskimos I built a cairn and left the enclosed report:—

FURY AND HECLA STRAIT, SATURDAY, APRIL 29TH, 1911.

I had orders from the commander, Capt. J. E. Bernier, to leave this report on the island seen by Hall from cape Englefield and to build a cairn. I went there yesterday, crossing it from east to west, returning last night. As I could find no stones on the island to build said cairn and as the ground was frozen too hard to make it of earth, I decided to leave this record on this point.

J. T. E. LAVOIE, C.E.

I had entirely recovered from the pains I had been suffering these last few days. Unluckily, my eyesight was not improving. My right eye, which I always used for my observations, was completely blind at night. To alleviate the pain, I was using the Eskimo cure, which consists of placing a cold stone alternately on each eye.

Sunday, April 30th, 1911.—Barometer at 8 a.m. read 30.059". Maximum temperature 18°, with northerly wind. It was with sorrow that I turned my back to Fury and Hecla strait this morning and started north. My intention, as I was coming down Prince Regent strait, was to send back Piomictoo from cape Hallowell with a note to the effect that I was surveying Fox channel, and would be at the Anglican Mission in Cumberland gulf in July, where I would board the "Arctic." Piomictoo was satisfied with the arrangement, but I could not persuade Koudnoo to follow me; as a year would have elapsed before he could have returned to Arctic bay, he was afraid that his wife and children would suffer from his absence and believe him lost. I was disappointed that the Eskimos I had met here last fall were all gone. I would have taken one of them and kept on.

At half past eleven we broke camp, heading for Whyte inlet. Eight miles from its opening, on the east coast, I discovered a small island, which I named O'Sullivan; it was at the mouth of a small bay running from S. 70° E. to N. 42° E. Due east, there was a narrow ravine and a small river running into it. On our way we passed several herds of reindeer. Whilst I was triangulating at this point we saw twelve others coming towards us. Six were killed, which were skinned and the quarters put on our sleighs. I had to stop the two Eskimos from killing the whole lot; they have a mania for killing everything they come across, even when not needed. At 7 p.m. we passed Ikalo river (Red Salmon) turning to N. by E. $\frac{1}{2}$ E. for 5.5 miles. At 8.45 p.m. we changed our course to N. W., the last five miles of Whyte inlet running in that direction. At 9.30 we were at the mouth of Ivisaracto river coming from the north. At 10 p.m. we followed its course for 4.8 miles and stopped at an altitude of 150 feet above sea level on Taasseel Ivisarac to White Salmon lake, where we halted for the night. Close at hand were a few salmon caches left this winter by the natives; we secured a few good ones. Finding that I had no more salt or pepper since yesterday, we ate some raw. They have a fine taste and do not need any seasoning. Numerous tracks of wolves and foxes were seen where they tried to upturn the stones to get at the fish. The barometer at 10 p.m. read 29.92" and the thermometer 0°, with a cold raw wind.

Monday, May 1st, 1911.—We broke camp at 10.30 a.m. covering three miles N. 52° E.; then we changed our course to east. I stopped at noon to take the sun's altitude. My observations gave me latitude 70° 30' 42" N. Where the lake turns to due east there is a sandbar running north and nearly right across; this led me to believe last fall that there were two lakes. Around this lake there are large undulating plains cut with shallow ravines, with brooks running into it. At 1.15 p.m. we left the lake, taking to an undulating plain in a N. 80° E. course for 4.6 miles, when we reached the water divide at an altitude of 450 feet above water level, where we met a herd of 14 reindeer. We then changed our course to N. 55° E., taking us to Taasseel Sapooting after a seven miles run. We passed numerous small lakes scattered over the plains, we covered 8 miles on the lake in an easterly direction and 1.8 miles N. 60° E. In the course of the afternoon we saw six herds of reindeer feeding in the plains along the shore of the lakes. This is the time of the year when they migrate from south to north and the country seemed full of them. A remarkable feature was that these herds were entirely composed of does, ready to bring forth their young. Not one single buck was seen.

Tuesday, May 2nd, 1911.—The barometer at 9 a.m. stood at 29.52". The maximum temperature registered 26°. The sky was partly covered with Cumulus and Pirus clouds, the wind blowing from the west. We broke camp at 11.15 a.m. in a N. 60° E. course, gradually turning to N. 45° E., which brought us to Kooke, the lake's extremity, at 2.30 p.m., after a run of 12.6 miles; we were then 130 feet above sea level. Following the river was impracticable, we went across the country and halted for the night at 9.30 p.m. There was no sun, and I lost my bearing several times. We passed about 20 herds of reindeer in one day, shooting two small ones.

Wednesday, May 3rd, 1911.—The temperature this day was similar to the day before, low clouds, foggy horizon and west wind. The barometer at 10 a.m. read 29.55", the thermometer rising to 38.2°. My solar observations placed me in latitude 70° 50' 55" N., longitude 82° 46' W. At 1 p.m. the wind veered to north; I resumed my journey, running N. by E. taking me to Berlingetto bay, 5.2 miles north of my observation point. We travelled north, following the east coast of the bay, for 15 miles, taking us to Taasseelloo, into which flows a river that the natives follow when they go to Igloolik, as it takes them to the head of Gifford river, called Kanerkshookjewa by the Eskimos. At 10 p.m. we were going east, following the shores of Taasseelloo to a bay running east and literally full of islands and reefs. At midnight the thermometer had fallen to 8° below zero, a change of 46° in twelve hours.

Thursday, May 4th, 1911.—After a run of 35 miles we halted in the morning for a rest. At 2.30 I found that I would have some corrections to make to my plans of last fall, as I had then been travelling in continuous fogs. I had not been



Looking for Seals, 1910-11.

able to take any solar observations and had worked on approximate bearings. At 3 in the morning the sun showed above the horizon. Tired and cold, I rolled myself, dressed, in my blanket and went to sleep on a snow bank. As we had no more blubber for our Eskimo lamps, Koudnōo and Piomictōo went seal hunting. They re-

turned at 6 a.m., a fearful storm having started, the wind blowing at the rate of 40 miles an hour. We pitched our tent and went to sleep. We were too tired to eat and just had a cup of tea. We met Koudnoo's sister and her husband, who were on their way back to Igloodik. They told me that Mr. Mathe was in Moffet bay prospecting with Ooming.

Friday, May 5th, 1911.—At 2 a.m. the thermometer registered 10° below zero. At 2.30 the glorious sun rose. It was below the horizon such a short time that we had 24 hours of daylight. At 3 a.m. the barometer read 29.559". I prepared our breakfast whilst the Eskimos were repairing the sledges and fixing our loads for an early start. At 6.30 a.m. we broke camp taking a course of W. 27° N. for 15 miles. Observations here showed that we were in latitude $71^{\circ} 20' 21''$ N. by longitude $82^{\circ} 35' 10''$ W. From this point I took the following angles: N. 88° E. land north of the group of islands where we camped, continuing in N. 55° E., N. 20° E., due north a high cape and point. At N. 43° W. land disappearing. Due west, a line of reefs close to large island finishing south. Leaving, we took a new course of N. 20° E., which, after 13.2 miles took us to the eastern shore of a bay. Cape Illusion bearing N. 20° W., and a line of reefs between it and the point of Crown cape, N. 15° W. The first cape I called Illusion cape for the reason that seen from where I took observations it looked very high and close, but as we advanced it seemed to recede and get smaller; this was caused by the refraction, as I noticed very often that a dog seen at a mile distant often looks as large as a pony. Crown cape was named after its peculiar form. At 6 p.m. we were at the bottom of the bay, having covered 11 miles in a N. 20° W. course. We then started across country and kept at it till 8.30 p.m. The sleighing on land was very bad, the snow breaking under our feet and sleds sinking. We covered but 4.6 miles in our last two hours and a half. We met several herds of reindeer. Two were shot and given to the dogs. At 8 p.m., the thermometer was 8° below zero. At 9 the barometer read 29.453". Provisions were getting low. At night I used the balance of my chocolate.

Saturday, May 6th, 1911.—The temperature rose during the night and it began to snow, the barometer indicating 29.301" of pressure at 11 o'clock. At noon the thermometer stood at 22° . I had waited till then to start, as I intended to take the sun's altitude. The clouds were so low and the atmosphere so damp that I failed. Therefore I continued my course by angles. We broke camp at 1 p.m., heading north through a tortuous valley studded with numerous small lakes. At 8.40 p.m. we came to the bottom of Moffet bay, 15.9 miles north of our last camping place. The plains that spread between this last and the one more to the south rise to an altitude of 135 feet above sea level and are surrounded by high bluffs. At the lower end of Moffet bay is a large oval mountain, 1,000 feet high and overlooking the whole country. It is so majestic and beautiful that I named it Mount Venus. At 8.40 p.m. we pitched our tent on the ice a few miles from the land. As I had work for about two weeks yet, I intended to cross to the west shore of Admiralty inlet to make a thorough survey of it. Koudnoo and Piomictoo went reindeer shooting whilst I was preparing the supper. They returned at 10 p.m. with five carcasses. At 11 p.m. I noticed that I had forgotten to cork a tin can containing $\frac{3}{4}$ of a gallon of gasoline. Unconsciously I placed it between my two knees to screw the cover on when the gases caught fire from my small stove that was two feet from me. There was a terrible explosion, the can splitting in shreds; I was severely burned, and were it not for my reindeer skin garment I certainly would have perished. My suffering was intense, and my speedy recovery was largely due to the kindness and skill of my Eskimo guide's wife.

Sunday, May 7th, 1911.—I was forced to rest in the tent as I was too weak to leave for the ship. Water was continually running from my sores, producing a burning itchy sensation. Large pieces of burnt skin and flesh fell from my face. I felt feverish and at times cold and unable to eat. I could not even swallow condensed milk. Piomictoo's wife looked after me as a mother.

Monday, May 8th, 1911. —Feeling somewhat stronger I told my men to prepare the sleds and make for the boat. We left at 1 p.m., leaving everything behind us so as to travel faster. My left eye opened to light, and I noticed I could see at a short distance. I tried to take the sun's altitude, but it proved too much for me. At 10 p.m., we stopped for the night. Although the temperature was not lower than the preceding days I was shivering all day. The Eskimos took good care of me; they gave me part of their clothing and wrapped me in a blanket when travelling.

Tuesday, May 9th, 1911.—At 9.30, we broke camp on our homeward journey. The thermometer stood at 9° above zero, my eyesight had improved a little, but at a distance of over 100 feet the objects appeared triple. Two seals were killed in the afternoon for our dogs' supper. At 9 p.m. the tent was pitched for another lonesome night.

Wednesday, May 10th, 1911.—The sun was already above the horizon before I went to sleep in the morning. I fell in such a heavy slumber that the Eskimos remained quiet, and it was half past ten when I woke up. I had my burns attended to, washed and bandaged, and after a hasty meal we resumed our journey at 1 p.m. At midnight we were still going, bound to reach the "Arctic" before stopping another night under the tent.

Thursday, May 11th, 1911.—At 3 a.m. I was climbing the gangway of the ship "Arctic," feverish, chilled and exhausted. I was so frightful to look at that the watchman failed to recognize me, nor did my faithful shepherd dog, which I had left on board ship. I called on the Captain, who was very surprised to see me in such a plight. The doctor was called and I was well attended.

I had suffered so much these last few days of my journey that after my arrival on board the ship I was laid down with inflammation of the intestines. I want here to express my gratitude and kindest regards to Capt. Bernier, who for a whole week attended me day and night.

This completes the narrative of my spring expedition, in which I had covered 816 geographical miles (939.6 statute miles), 508 on my journey to cape Hallowell and 308 on my return journey through Admiralty inlet. The corrections in the north of Admiralty inlet were made July the 29th, on board the C.G.S. "Arctic" when leaving the harbour. Baillarge bay was located by triangulation from the "Arctic," taking cape Crauford as my base. It is situated between Elwin inlet and Strathcona sound. From there also was located the bay on the west shore of Admiralty inlet, in about the same latitude. I found through my observations that all the sounds on the north of Baffin island trend to the east, and not to a true south course, as some of them are shown on the chart.

APPENDIX No. 3.

REPORT OF J. E. T. LAVOIE ON SURVEYS ON THE NORTHERN COAST OF BAFFIN ISLAND, IN AUGUST, 1911.

Tuesday, August the 8th, 1911.—By your order, we left Albert harbour in latitude 72° 40' N., longitude 77° 48' W., at 9.45 this morning. The whole party consisted of First Officer O. J. Morin, captain of the launch and my helpmate, P. Mercier, engineer, A. Nolet, fireman, Wm. Morin, sailor, J. E. Mathé, geologist, A. English, mineralogist. I was in charge of the expedition. In leaving Albert harbour we headed due west, stopping at the Eskimo village for Second Officer Janes and five natives, who were towed as far as Salmon river in a whaleboat. The boat contained our provisions, tents, coal, etc. A light canoe was also towed, for use in going ashore.

At 5 p.m. we went ashore, took water, set up the tent and prepared our dinner. The inspirator having gone wrong we were delayed till twenty minutes to ten. As the time to complete the work we had to do was rather limited, we decided to run by watch, which we did the greater part of the night. At 11.30 p.m. we passed

two Eskimo toupiks and saw several natives. We hailed them and inquired if we could obtain either fresh salmon or caribou. Neither were to be found. The course we then followed was S. $64^{\circ} 30'$ W. At midnight, running S. 53° W., we passed the mouth of a large river forming a delta and running into a small bay in four branches. The distance is 29 miles west of Albert harbour; salmon are plentiful in the bay. From Janes creek this part of the coast of Baffin island is a gentle slope, covered with a luxuriant Arctic vegetation, and resembles a perfectly kept lawn. Of course, as there are neither trees nor even shrubs, it lacks variety of scenery, except here and there a small brooklet.

Wednesday, August the 9th, 1911.—At midnight I took my watch. In a few minutes a thick fog rose from the water covering the whole horizon. It was so dense that we could see but a couple of yards around us. I then ran into a field of broken ice running with the tide. Mr. Morin was called to work the launch through it at 1.30 a.m. Going half speed we struck a reef; no damage was done, but we were alarmed as the boat slipped off on the other side and kept on its course. At 2.20 a.m., finding a convenient spot, we anchored the launch off a grounded iceberg and pitched our tent on the rocky shore. Wm. Morin, acting as watchman, kept walking on the bank the remainder of the night. The engineer and the fireman slept on the bunkers in the launch. Mr. Mathé and Mr. English spread their blankets near a huge boulder. Mr. Morin and I retired to our very small tent. The fog was thick all morning, delaying our departure till half-past twelve. It began to clear at 10 a.m., showing clouds in the skies. The heat from the sun was felt and soon dried our blankets. At noon the barometer read 29.948 and the thermometer 54° above zero, one of the hottest days of this region. Before leaving, we took the sun's altitude, placing us in latitude $72^{\circ} 31' 51''$ N., longitude $79^{\circ} 20' 45''$ W., and indicating the opening of a sound (no name) more to the west than shown on the chart. This point we made the centre of all our subsequent observations and triangulations. The coast for 8 miles is not regular, but full of small bays and indentations and rising rapidly, looking southward. One mile from our observation point, course, S. $5^{\circ} 37' 38''$ W., we took the angles of the different landmarks, the course for the middle of the sound then bearing S. by E. and closing our view. At 1 p.m., going at a rate of 6.5 miles an hour and due south, we passed a small island and bay. At 6.15 p.m., we stopped near a reef half a mile from land. We then rowed ashore and took new observations. They gave us latitude as $72^{\circ} 30' 00''$ N., longitude $79^{\circ} 29' 45''$ W. I then placed my theodolite on a rock, and with Mr. Morin triangulated the opening of the sound. A large island between this and Arctic sound was between angle S. $45^{\circ} 30'$ W. to W. $21^{\circ} 30'$ N. At 3.20 p.m. we resumed our journey by the following courses:—

$2\frac{1}{2}$	miles E. by S. $\frac{1}{2}$ S.	(S. $73^{\circ} 07' 30''$ E.).
$6\frac{1}{4}$	" " " "	(78° S. $45' 00''$ E.).
7	" " " "	(S. $84^{\circ} 22' 30''$ E.).

This sound is very deep, especially the last thirteen miles. Its total length is 31 miles. Its waters are of a peculiar opaque blue, not seen in other bays. Its north side is very rich in vegetation; although of an altitude of 100 feet, it is steep and abrupt. The south shore, on the contrary, is barren, formed of steep, high, and, in some places, perpendicular bluffs of metamorphic rocks. It is also higher than the first one, in some places rising to 1,800 feet. In its last twenty miles it contains four narrow ravines. There is certainly a peculiar pleasure and sensation in exploring new country through unknown waters and contemplating the wild beauties of the northern regions.

Whilst working at our observations this afternoon, Mr. Mathé and Mr. English went exploring. Nothing of value in minerals was seen by either. Mr. Mathé found an Eskimo skeleton and recent tenting place of the natives. Mr. English brought me various splendid specimens of Arctic flowers in which this sound is very abundant. Here we also found a piece of a log 12 inches in diameter by 6 feet long, and one of three inches by twelve feet. Twenty-five miles E. by S. $\frac{1}{2}$ S.

of our observation point we discovered a harbour on the south shore of the sound. Its opening is three miles wide, and it runs inland S. by W. for a distance of $2\frac{1}{2}$ miles. It is surrounded by huge black cliffs, its waters are of a still deeper blue than noticed elsewhere in the sound. This harbour is very deep and would therefore afford poor anchorage. Thirty feet from the shore we failed to reach bottom with an eight fathom line. Its southern part has a canyon and river running in which is fed by a huge glacier several miles inland, but quite visible from where we were. Mr. Mathé and Mr. English followed the valley thus formed, studying its geological formation. The sound itself continues in an E. by S. $\frac{1}{2}$ S. direction for another six miles, where another river runs in. We were unable to ascertain if these were frequented by salmon. Our work in this harbour being over, we reached our bearing, started west, this time following the south shore. After a run of twelve miles, we passed another harbour similar to the one already described, but running to a great depth inland S. by W. for five miles. We then kept on exploring and studying the lay of the ground. At midnight, my watch being over, Mr. Morin replaced me at the wheel. We had splendid weather and took advantage of it in our work.

Thursday, August 9th, 1911.—Our launch was kept steadily moving till a quarter past two in the morning, when the anchor was dropped. We were in latitude $72^{\circ} 20' 40''$ N., and longitude $79^{\circ} 54' 15''$ W. and N. $\frac{1}{2}$ E. of yesterday's observation point. At noon the observed sun's altitude was $66^{\circ} 24' 00''$, with skies somewhat cloudy, wind variable. The barometer read 30.50 and the thermometer 44° .

Cleaning and repairing the engine delayed our departure till 1.20 p.m. We decided to explore the shores of the bay, and anchored in this morning. It is semi-circular in shape and runs two miles inland in a S. by W. course. A small river empties into it, coming through a large valley. One mile inland we discovered one of the lakes that fed it. We also found out that salmon were in abundance at its mouth. We made futile attempts to seine a few, being hindered by the depth of the water and the rocky bottom. We found here old abandoned stone huts and a number of tent circles. The shores bordering the valley's mouth are swampy and covered with a thick carpet of moss. Although wet, it afforded us a soft couch. At 1.40 p.m., the pass through which we steamed bears S. 40° W., turning for the last mile to S. $17^{\circ} 30'$ W. At 2 p.m. we came to Arctic sound, and changed our course to due south. At 3.15 p.m. we stopped on the north shore of bay Paquette. We went ashore here and took observations before going back. I thought that it was preferable not to go to the bottom of this sound, which has already been surveyed and is correct. I preferred to explore the bays between it and Milne inlet, thus completing the map of this part of Baffin island.

The whole coast of Arctic sound is rugged, abrupt, and composed of metamorphic rocks, broken at different intervals by deep, narrow ravines. There are no banks, the cliff rising sheer from the sound, except in its southern end, which extends in a gently sloping plain. The vegetation is very scarce and poor throughout the whole of it. The waters are very deep and sure for navigation.

At 5.40 p.m., after lunch, Mr. C. J. Morin and I climbed a very high cliff. We had a most magnificent view of Arctic sound, looking north. The west channel of the second large island we discovered was blocked with ice. This island I named Frechette island for our National poet. At 6.30 p.m., everything in readiness, we resumed our journey. The skies were cloudy, and the wind, coming from the north, was damp and cold. Passing near Frechette island, I took its height, 51° by 800 feet base, showing it to be 998 feet high. It is over five miles long by four wide. It has an imposing appearance, rising a huge perpendicular mass from the water. Its northern end is slightly over 800 feet high. It is formed of part of what is shown as the west shore of Arctic sound on the charts. At a quarter to eight p.m. we were enveloped in very dense fogs and ran amongst reefs where the current was very strong. The waves breaking on

the rocks made a great noise. These reefs rise from the deep water; the highest was about 35 feet above the sea. We anchored close to the reef, waiting for the fog to lift, as it seemed likely that we would spend part of the night here. The compasses being entirely useless in these regions, it was impossible to look for a convenient anchoring place through angry waters that would soon have submerged our open launch, with its side only one foot above water. Mr. Morin, J. E. Mathé, W. Morin and I rowed to the rocks. We built a small cairn on the highest, and in case of any accident befalling us, I wrote the following note, wrapped it in a shot gun cartridge and placed it in the cairn:—

“BEACON REEF, August the 10th, 1911.

“To whoever shall land on this dreary and desolate islet we desire to inform you that the steam launch Arctic Junior, in charge of First Officer O. J. Morin, acting captain, J. E. Lavoie, commander, P. Mercier, engineer, A. Nolet, fireman, Wm. Morin, sailor, J. E. Mathé and A. English, geologist and mineralogist, having left Albert harbour on the 8th inst. on a surveying expedition, have completed the survey of unnamed sounds east of Arctic sound, which last was finished to-day at a quarter to eight p.m., were caught in a very thick fog and came across these reefs at 8.20 to-night. Landing, we built this beacon, therefore calling these breakers Beacon reef, and left enclosed report. Everybody is well; leaving as soon as fog lifts to survey two uncharted bays west of Arctic sound.

Signed “J. E. LAVOIE, C.E.

“O. J. MORIN, 1st Officer.”

P.S.—On est Canayen ou on ne l'est pas. Deo Gratias.

Record put in cairn at 9.30 p.m. Had we lost our launch or lives, search parties would thus have been enabled to trace us. Although exposed, yet we were all hopeful and did not think seriously of the situation beyond taking prudent steps to prevent accident. At 9.35 p.m. I took my watch for four hours, the other hands going to a well-earned sleep. As we had no place to set our tent, we ate a cold supper, hard tack and water. The men spread their sleeping-bags on the boat in which we towed our coal and provisions, crawled in, and were soon fast asleep, paying no attention to the unevenness of their beds nor the drizzling rain beating on their faces. The engineer and fireman had curled up in a space 4 feet by 4 in the prow of the launch, right against the boiler.

At 1.30 a.m. I called Mr. Morin for his watch and I took his sleeping quarters. They were on the bunkers, one foot and a half wide by five feet long and right against the side of the boiler. Although uncomfortable, I slept well. It was warm compared with the boat, a point gained, as the thermometer fell to 34° during the night.

At six this morning we were up and doing. The thermometer read 38° and the barometer 31.00'. The zenith was clear, but the fog heavy on the whole horizon, hiding objects at a distance of a few yards.

At 9 a.m. we hove anchor and headed S. by W. $\frac{1}{2}$ W. (S. 61° 52' 30" W.). This course led us to the opening of the third bay, running S. by E. for half a mile and then S.S.E. At a quarter to ten one of the tubes of the boiler burst and a stream of water fell on the fire. We then could just see land and made for it. A few feet from the shore, finding a convenient spot to throw the anchor, I went on the prow to heave it; in doing so one of the prongs caught in my vest. I was within a hair breadth of following it in four fathoms of water. At noon we managed to take observations, placing us in latitude 72° 20' 42" N. Whilst the engineer and the fireman were repairing the burst tube, A. English and Wm. Morin set the tent on a loose rock, 18 feet square and just balanced over the deep blue waters. We piled stones for a ladder to climb on it and had our provisions and blankets thrown on. It was the only level spot on this shore. Quite close to us was a

small torrent rushing from the mountain side and fed by an island glacier. Although the fog was hanging heavily on the horizon, the upper sky was clear and bright with a beautiful shining sun. After all we feel happy and contented. The northern solitude is broken by the hammering of the engine screw and the saw was grinding through the pine log we found, as it was needed to plug the tube. The torrent is roaring and the snow bunting gaily chirping. It is elevating to feel ourselves living creatures in these desolate regions, thus uniting natural legitimate pleasures with our work. This afternoon we took another sun altitude. Through a rift in the fog we saw that we were right at the foot of a huge perpendicular mountain. We lifted our heads and tried to see its summit. We even conjectured what would happen if blocks were to detach themselves from its side. We measured it with the sextant and found it to be 3,532 feet high, at foot $86^{\circ} 44'$. In the course of the afternoon the fog increased to such a density that it hid the sun.

At 5 p.m., feeling tired and sleepy, O. J. Morin and I spread our sleeping-bags in the tent and took a rest. At 8 p.m. we were awakened by a tremendous roar shaking the very ground and oscillating the rock we were on. An immense rock had detached itself from the mountain rock. It split in two and changed its course; small stones were projected in all directions, passing over our heads and falling in the bay. We rose in a hurry thinking that an explosion had happened and that the engineer and fireman were blown to atoms; we saw them pale faced and terror stricken. They had witnessed the fall, and also Mr. English; from the first they had been so horrified and spell-bound and felt so sure that we were in the path of the falling stone that they had been unable to shout a warning. Wm. Morin, all laced up in his sleeping-bag, was caught by Mr. Mathé so as to avoid the stones. He started rolling on the rock and nearly fell in the water. A piece of broken rock, 6 x 5 feet, landed right over us at an altitude of 150 feet. It was noticed only after the dust raised by the avalanche had dispersed. The leaking tube was plugged twice in the afternoon, but gave way each time when tested. The men kept working at it till midnight, when we all retired for a night's rest. We certainly felt a little nervous, as we could not under the circumstances change our location. We commended ourselves to Providence and trustfully went to sleep. The weather was still raw and foggy.

Saturday, August the 12th, 1911.—We all set to work early this morning, the weather still damp and foggy. At 11 a.m. it began clearing and the fog rolled away. At noon we took the sun's altitude ($65^{\circ} 15' 50''$), placing us in latitude $72^{\circ} 20' 42''$. Our p.m. longitude gave us $80^{\circ} 30' 00''$ W. Immediately after lunch Mr. Mathé and Mr. English started on an expedition, prospecting amidst the cliffs. Mr. Morin and I climbed to a point 950 feet above sea level, at a distance of a thousand feet from our latitude point, in a W.N.W. direction, set the theodolite, and took angles of this sound. From $S. 40^{\circ} E.$ to $S. 55^{\circ} E.$ there is a small island and reef between Frechette island and the shore. From $S. 55^{\circ} 40' E.$ to $N. 24^{\circ} E.$, Frechette island. At $N. 18^{\circ} E.$ Beacon reefs and opening of the Arctic sound. From $N. 20^{\circ} E.$ to $N. 3^{\circ} W.$ is situated the large island at the mouth of the Arctic sound. At $N. 1^{\circ} 30' W.$ small islands and reefs; $N. 9^{\circ} W.$ reef; $N. 12^{\circ} W.$ reefs; $N. 15^{\circ} W.$ reefs. These reefs bear $N. 41^{\circ} 30' W.$ from north of Frechette island, the west coast bearing N.N.W. On returning to our tent we passed the ravine near our camping place. We saw part of the rock that came crashing down yesterday. It must have been very large, as one of the broken pieces that had furrowed the banks of the ravine measured over twenty square feet. The engine being repaired and in working order, we steamed off at 4.40 p.m., with 35 lbs. steam pressure. The mountain at the foot of which we had camped I named Sister Emma.

At 6.50 p.m. we entered the last bay on this shore. It bears S. by W. $\frac{1}{2}$ W. Its coasts are also high and formed of rugged cliffs of a wild grandeur. Four miles from its opening this sound turns to S.W. by S. for three miles, forming an

indentation. Where it changes direction a rocky ledge about a quarter of a mile long advances from the west shore, bearing E.S.E. From S.W. by S. the west shore deepens, forming a semi-circular bay. Nine miles from its opening a good-sized river coming from S. 17° E. empties into a small river on the east shore. In line with the river, but in the middle of the sound, is a small low island a mile long, fifteen feet above sea level. Bearing E. by N., there is a deep channel on both sides of it eight miles from the mouth of the sound. On the west shore we passed a narrow channel running towards Eclipse sound, thus forming a new island. Its direction and length follows. As we went to the south the land diminished in height. From an elevation of 2,000 feet it gradually falls to 660 feet. The total length of the sound by measurements is fifteen miles. At its bottom it forms a bay two miles long and running S.E. by S., in latitude $72^{\circ} 24' N$. In $72^{\circ} 27' 52'' N$. we found a small cove where we decided to spend the night. The coast all around was gently sloping, forming a valley with a luxuriant growth of Arctic flowers and mosses. Between the cove and bay, at the bottom and on the point separating them was a lonely, steep and abrupt hill 670 feet high, barometric measurement. It stood right at the mouth of the valley, finishing at the two named bays on the east shore. This hill was about two miles long by $\frac{3}{4}$ of a mile wide. Whilst the others were busy preparing supper and taking a supply of fresh water from a nearby brook, I decided to climb the mountain and take a photograph of the country. I started with Mr. Wm. Morin. After $\frac{1}{2}$ mile walk we rested at the foot of the hill. It looked to be a pretty difficult ascent; it rose for 580 feet in a slope of 1 to 1, then the next forty feet presented a perpendicular surface with only a few cracks and narrow ledges here and there. Above this wall it rose for another fifty feet more easily ascended, but dangerous on account of the water undermining it, and which we could hear dripping. The first part was composed of loose angular stones, constantly rolling under our feet. It was ascended without any incidents, but we nearly came to a speedy end. When climbing the wall, Morin was ahead of me, pulling himself up from one crevice to another. When about ten feet in midair, hanging by toes and nails, a quiver went through me. Attacked by hawks, whose domain we were invading, my foot slipped and I came very near being hurled down. I felt so weak that I told Morin I could go no further and would try to get down. As for him, he was too far up to attempt to come down. Some way or another I found myself freely breathing at the foot of the wall, and began to look for a more convenient spot to climb. During that time Morin had succeeded in getting over this obstacle, and was going over the upper slope of the mountain on hands and knees, when down came an avalanche of mud and loose stones, taking him right to the brim of the cliff. There he hung on a projecting rock. He felt so weak after such a narrow escape that, although he had had but one meal in the morning, his stomach was badly turned. This vomiting brought him back to his senses, and he resumed his ascent under the impression that I had been crushed under the debris. On my part, I was looking at the rocks falling down, expecting to see his mangled body coming down with them. Seeing nothing of the kind, I walked half a mile further and found a more convenient place to pull myself up. I was busily climbing the last fifty feet when I saw him. I hailed him, and on meeting we shook hands as two men just rescued from death. He was so pale and weak that he wobbled on his feet. He felt so sure of my fate, as he was under the impression that I followed him, that he neither yelled nor dared to look behind. Lieut. O. J. Morin and the others had heard the noise caused by the falling of the rocks and decided that if we were not back in $\frac{3}{4}$ of an hour to come to our rescue. Once on the top of the hill, I took the lay of the country around us. The summit of the mountain itself was level; it had three small lakes on it, looking to the east and south. The island was formed of large green plains of a gentle slope, entirely free of snow, and dotted with numerous small lakes and rivulets discharging into the bay. To the west and north the land was rocky and abrupt. Our observations here being over, a hard proposition

faced us; how were we to get down? We walked around the whole hill before we decided on a descent, but not by a too safe place at its eastern end. At midnight we were back in camp, exhausted and famished, our last meal having been taken at 10 a.m. The soles of my boots were entirely gone. Walking over the angular stones and pebbles barefooted was anything but pleasant. In the interval from my departure to my return to the camp, English and Mathé had been looking into the formation of the plains and hills.

Sunday, August the 13th, 1911.—We had supper at 12.30 this morning; it consisted of partridges killed yesterday and had been prepared in our absence by O. J. Morin. At 2 a.m. we all crept into our sleeping-bags, spread here and there on the pebbly beach. We were all so tired that nobody awoke before nine this morning. The sun was brightly shining and the skies of a deep blue with only a few clouds, and not a breath of wind stirred the calm surface of the waters. The thermometer registered 48°. This spot we decided to call bay of Rest. After breakfast, we took the sun's altitude and found we were in latitude 72° 27' 42" N. At 12.10 p.m., we resumed our journey; at 1.30 we entered the strait on the west shore of the sound. It is seven miles long, runs N.W. by N. four miles and N.E. for three miles. Two miles from its opening (coming from the south) there is a bay on its south shore two miles deep and bearing S.S.W. into which a medium sized salmon river runs. The first part of this pass is $\frac{3}{4}$ of a mile wide, increasing to a width of two miles after the bay is passed. Its coasts are high and very rugged, but mostly cliffs of different shapes. In all these bays and sounds the water is unusually deep. In some of the smallest we saw large icebergs afloat. At 2.40 p.m., when we changed our course to N. by E. to N. 15° W., looking towards Pond's inlet, mount Morin was visible to the east, the western end of Bylot island bearing N. 5° 37' E. and a reef near the shore N. 30° W. At 3.10 p.m. we changed our course to N. 30° W. The reef is half a mile west of the point on the eastern shore of an indentation running W. by S. and one mile wide. After a two miles run, we came to the opening of a small harbour, bearing N. 50° W. The entrance to this cove is about 1,500 feet wide, running south by E. for half a mile, then forming two larger bays; the first one bears S.E. It has a reef near inner end. The other one, which is the larger, bears N.W., and is a mile deep. There are five reefs near the eastern entrance of this harbour and a larger one at its western. With care it can be entered safely by large ships, and would be an ideal harbour for wintering. At 4.20 p.m. we changed our course to N. 60° W. and S. 68° W., going around a rugged island. There is a line of reefs extending from 50° to N. 70° W. In taking our last course, we passed over numerous water covered reefs, bearing N.W. by N. This part of Milne inlet is not navigable and would be unsafe even for ordinary sailing vessels. At 4.30 p.m. the plugs of the bursted tube came off; we hurried ashore for repairs, as the current running through the reefs is very swift. Nearly every hand worked at refitting the engine. Mr. Mathé went prospecting, and I set up the tent and prepared the supper. Everything was in readiness at 7.30 p.m. The barometer read 30.75 and the thermometer 48° with the wind from the south, the sky partly covered with clouds. We heard what we thought at the time to be thunder claps, but found out later that the noise was caused by large icebergs disintegrating, for it happens often in the summer that the sun's rays cause the confined air to explode. In such cases the surface of the water is covered with small pieces of floating ice. In latitude 72° 28' N. we passed the mouth of a small harbour bearing N.E. The largest of the ragged islands extends nearer the east coast of Milne inlet than is shown on the charts; the southern end is very low and extends within 700 feet of the shore. The passage between it and the main land is full of submerged reefs for $\frac{1}{2}$ a mile. At 11.30 p.m. we passed Eskimo inlet and continued to steam south, taking into account that Capt. Milne's survey of these coasts was correct and as printed on some of the charts seen, and not as shown on the last maps published by the Department of Marine and Fisheries (see Chart 2177, J. & C. Walker, Sup.,

London, Published at the Admiralty, 14th Dec., 1852, Capt. Washington, R.N., F.R.S., 1151). I owe special thanks to the Commander of the expedition for the loan of these charts since I came to Ottawa, as it enabled me to complete my work.

Monday, August the 14th, 1911.—Our little engine kept gaily puffing and chucking as we advanced in Milne inlet. At 3 a.m. we were abreast of the north end of Stephens island, running in fair weather, passing its south end at 3.50. At 4.00 we were turning Bruce headland and entering Milne harbour. At 4.45 a.m. we were alongside the C.G.S. "Arctic," welcomed by the Captain and the men on watch. In five days we had covered and surveyed close on to 300 geographical miles. The last inlet runs S. by E. After a three hours sleep on board the ship, we left again to visit the bay N. $\frac{1}{2}$ E. of Milne harbour, which we called Assomption bay, it being the vigil of Assomption Day, national holiday of the Acadians, to whom I am related. We stopped on the west cape of its entrance and found the latitude $71^{\circ} 43' 56''$ N., longitude $81^{\circ} 41' 00''$ W., the bay running six miles more to the south. On this cape I found a vein of mica. We went towards the opening of Philipps creek, but as the tube of the boiler was beginning to leak we turned back and arrived at the ship at 2.35 p.m. Toward evening I went ashore at the mouth of the river running into Milne harbour. It comes through a wide green valley of easy ascent and rich vegetation. A few miles inland it forms a beautiful fall as it thunders down a rock some twenty feet high. I felt so exhausted after this trip that I can but dazedly recollect what happened till we started on our way back. Before finishing I must give full credit to the men who accompanied Mr. Morin and myself on this expedition. They were all the time civil and full of good will, they never lost their good humour once during all the voyage, and went through hardship contentedly. On several occasions we were nineteen and twenty hours without sleep and travelled without taking a meal. Yet they never complained. We had to act thus as we had much work to do in a very limited time.

Yours truly,

J. E. T. LAVOIE.

N.B.—All the bearings given in this report are true.

APPENDIX No. 4.

METEOROLOGICAL REPORT OF J. T. E. LAVOIE, C.E., FROM OBSERVATIONS AND RECORDS DURING CRUISE OF "ARCTIC," 1910-11.

To Captain J. E. Bernier,
Commander of the C.G.S. "Arctic."

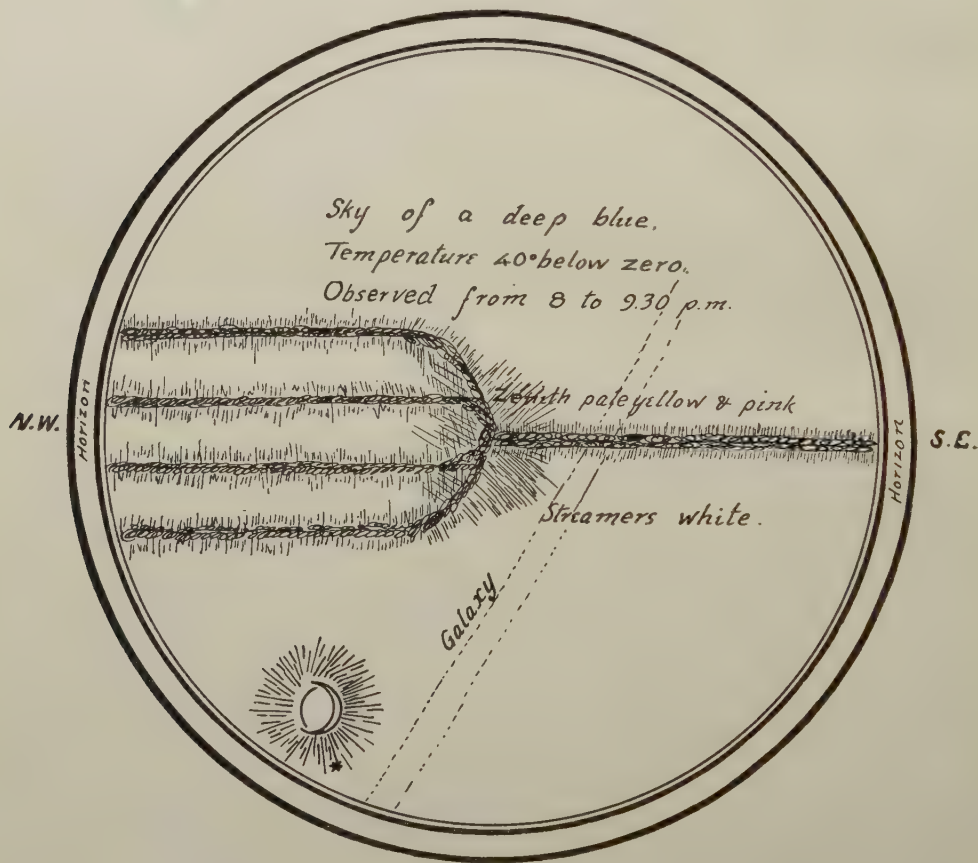
Dear Sir,

I beg to submit for your approval and publication the meteorological observations made during the whole voyage of the C.G.S. "Arctic," from July the 12th, 1910, to September the 24th, 1911. The instruments used were two mercury and two spirit Fahrenheit thermometers, and two standard barometers, obtained from the Toronto Observatory. When the ship was under way, the barometric readings were taken from the ship's aneroid.

The readings were made with the greatest care, recorded and checked daily. The prevailing wind of the day was also recorded. As I had no anemometer, the velocity of the wind is given, of course, approximately. Arctic bay, our winter quarters, is protected by high and steep mountains, consequently the wind was never blowing at so high a rate as it was outside the harbour. The wind outside often reached a high velocity when in the harbour it was comparatively calm; therefore, the direction and velocity of the wind varied according to the locality, and would not apply, as a rule, to the north of Baffin island.

The general state of the weather day by day is given, as well as miscellaneous phenomena. Temperature of the surface sea water was registered weekly. The barometric readings were recorded daily at 8 a.m. and 8 p.m. of the 75th meridian, so as to coincide with the observations taken at the central Observatory in Toronto. I also kept a barograph registering from December the 1st, 1910, till September 24th, 1911. Unluckily, I was not furnished with wet and dry bulb thermometers.

The mercury froze nine times in December, 15 in January, and did not thaw during the last (6) six days of January. The mercury was also frozen from the 1st to the 12th of February. During March it was frozen every night from the 1st to the 16th inclusive. I noticed that after a few days of intense cold it would remain frozen for two or three days, even after the temperature had risen to 34° below zero. 



Aurora Borealis observed in Arctic Bay on March the 4th 1911.
J. Macdonald C.E.

Of the phenomena observed the most remarkable was an aurora borealis. It was of such a peculiar formation that I consider a description valuable and interesting, and have made a drawing of its form. On March the 4th, 1911, I went out at 8 p.m.; it was then 40° below zero. The northern lights presented the most attractive and varied forms it has ever been my privilege to view. The

sky was of a deep blue and millions of stars were shining. Right from the horizon, in the south east, a band of light was rising, white and uniform. At the zenith it divided, forming four long white streamers which disappeared at the horizon in the north west. Where it divided there was a slight tint of yellow and pink. Vivid flashes proceeded constantly from this aurora borealis without changing its form or shape. I remained out until half-past nine, admiring its display and illumination, but as the weather was extremely cold I was forced reluctantly to go on board ship for a short time. Coming out again a few minutes past ten, I found the extraordinary display had vanished. I regret that I had been unable to remain in the open air and watch it fade away, for it may have assumed other forms before disappearing. On March the 17th, during my surveying expedition, whilst going across Brodeur peninsula, from Admiralty inlet to Prince Regent strait, I noticed a most beautiful sun's corona with three mock-suns, circular and semi-circular halos of most brilliant colours. A full description of it will be given in the report of my trip.

Through observations in July and August, this summer, I came to the conclusion that the temperature on the surface of the water is somewhat colder than in the atmosphere a few feet above. On August the 22nd, the minimum of the thermometer was 29° , the freezing point of the salt water.

That morning the new ice was $\frac{1}{2}$ an inch thick.

On Aug. the 23rd	min. temp.	32°	New ice	$\frac{1}{4}$ "	thick.
" " 24th	" "	34.3°	" "	$\frac{1}{8}$ "	"
" " 25th	" "	32.0°	" "	$\frac{1}{4}$ "	"
" " 26th	" "	31.5°	" "	$\frac{1}{2}$ "	"
" " 27th	" "	28.9°	" "	1"	"

My thermometers were above the top bridge, twelve feet above sea level.

The lowest temperature registered was that of February the 7th, the thermometer falling to 55.2 below zero.

The cold in the Arctic is extremely dry, without any appreciable moisture from the beginning of December to nearly the middle of April, when the mercury begins to rise above zero. Therefore, it snows very little, the total precipitation for the season being eleven and a half inches.

The warmest day in the Arctic bay was registered on July the 7th, the thermometer rising to 53.4° above zero, with a strong north-west wind blowing at the time. During the return journey, 54 above zero was registered on the 14th of August, in Milne harbour.

I also made a few observations with the thermometer exposed directly to the sun's rays. The highest point registered was 67° , and that on July the 21st. The sailors were all complaining of the intense heat, throwing coats and vests off. It was very calm, not even a breath of wind stirring the surface of the deep waters.

Respecting the ice formation, I here give the following data : Arctic bay began to freeze in September ; on October the 1st, the new ice was four inches thick. Adams Sound closed on the 6th. Only one measurement of the fresh water ice was made, namely, on the 3rd, when the thickness was 10 inches. The salt water ice continued to increase in thickness regularly, being 13 inches at the end of October, $16\frac{1}{2}$ inches at the end of November, 26 inches at the end of December, 32 inches at the end of January, 38 inches at the end of February, and 45 inches at the end of March. Although the thermometer rose above zero in April, the ice still kept on regularly increasing, giving 53 inches at the end of April, and 56 inches, its maximum, on the 20th of May. The following measurements show the decrease in thickness: 27th of May, 52 inches. It then steadily diminished, leaving 43 inches at the end of June, the under part being all honeycombed. On July the 10th, it showed 12 inches, when it began to break up by the action of the wind and tide. Outside Arctic bay the breaking up occurred when the ice still had a thick-

ness of two and three feet, leaving open leads from Adams sound to Lancaster sound on the 29th. Pond's inlet cleared on August the 5th. The ice retains a large percentage of salt, rendering it unfit for use. I tasted it at different intervals during the winter, and could not mark any difference, either on top or below. I owe particular thanks to the first officer, Mr. O. J. Morin, for part of these observations.

When new ice forms in the fall, beautiful crystals of various and regular geometrical shapes are formed on its surface. These are very saline, keeping the newly fallen snow in a half melted condition and rendering the travelling very unpleasant and wet. The snow next to the ice is always unfit for usage, even towards the end of the winter.

The whole mean barometric readings gave a pressure of 29.9294 inches. As a rule the barometer is very regular, showing slight variation. November was the only month that the mercury remained above 30 inches.

I am greatly obliged to the first and third officers, Mr. Morin and Mr. MacDonald, who were kind enough to take the observations whilst I was away from the boat and laid up by sickness this spring.

Yours truly,

J. T. E. LAVOIE, C.E.,

Scientific Officer on board the
C.G.S. "Arctic" for 1910-11.



Stern of the "Arctic" with the natives who worked at the Canal, June, 1911.

MONTH OF JULY, 1910

Day of M th	Fahrenheit		Barometer		Clouds	Gen'l State of Weather		Wind	Temp. Surface Sea-water	Ice Thickness	Snow Precip.	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Range	Mean		Midnight to Noon	Noon to Midnight						
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11	6.40												
12	55.0	52.3	53.65	29.65		Windy	Very Fine.	W.	53°			Belle Isle S.	Thermometers set 6' above sea-level.
13	55.0	44.8	49.90	29.97		Fine.	"	N.W.	49°			"	
14	55.0	40.0	47.50	30.00		Wet and Foggy	Wet & Foggy	N.E.	41°			Atlantic	
15	41.0	38.5	39.75	29.78		"	"	"	40°			"	
16	50.0	39.2	44.60	29.89		"	"	E.	43.5°			"	
17	46.0	43.0	44.50	29.95		Rainy	"	"	40°			"	
18	45.8	41.8	43.80	30.10		Fine	"	N.	40°			"	
19	46.0	37.8	41.90	30.00		"	"	N.W.	39.5°			Coast of Green- land	Lat. N. 68° 00' Long. W. 54° 08'
20	46.5	39.7	43.10	29.93		Overcast	Overcast	S.	38.8°			"	" 68° 00' " 54° 10'
21	44.2	39.2	41.70	30.08		"	"	S.W.	39°			"	" 62° 12' " 53° 53' Sun sets about 10 p.m.
22	44.6	39.2	41.90	29.85		"	"	N.E.	38.5°			"	" 64° 45' " 54° 08'
23	44.7	37.0	40.85	29.88		"	"	W.	30°			"	" 66° 48' " 54° 50' p.m. very foggy
24	34.5	29.1	31.80	29.84		"	"	E.	31°			"	" 69° 10' " 54° 55' Snow flurries
25	33.0	29.3	31.15	29.95		"	"	"	31°			"	" 71° 12' " 55° 40' " 58° 12' Snow flurries, Hail and rain
26	32.2	26.8	29.50	30.00		Clearing Cloudy	Sunny Overcast	W.	32°			Smith sound	" 72° 52' " 57° 25' " 59° 05' Snow flurries, Hail and rain
27	33.0	32.0	32.50	29.90		"	"	N.E.	32°			"	" 74° 02' " 59° 05' Midnight Sun.
28	34.9	30.7	32.80	29.93		"	"	N.W.	34.5°			"	" 75° 04' " 69° 50'
29	35.8	32.4	34.10	29.95		Fine Overcast	Bright Overcast	S.W.	30°			Ponds inlet	" 73° 22' " 73° 40'
30	34.5	33.2	33.85	29.85		"	"	"	30°			"	" 73° 40' " 76° 30'
31	40.2	31.5	35.85	29.95		"	"	"	32°			"	" 73° 40' " 76° 30'
Sums	851.9	737.5	794.70	598.45					783.3°				
Means	42.6°	36.9°	39.7°	29.922					37.3°				

MONTH OF AUGUST, 1910

Day of Month	Fahrenheit			Barometer			Clouds	Gen'l State of Weather.		Wind	Temp. Surface	Ice-Thickness	Snow Precip.	Locality	GENERAL REMARKS.
	Maxi- mum	Mini- mum	Range	Morning	Evening	Mean		Midnight to Noon	Noon to Midnight						
1	42.0	31.9	36.95	29.960	30.060	30.010	Str. Nimbus & Alto-Cum.	Very Fine	Very Fine	N.W.	31.5°			Albert Hr.	Lat. N. 72° 41', Long. W. 77° 55'. Rain 7.15 to 8 p.m. Interval Fogs.
2	46.6	34.3	40.45	30.100	30.110	30.105	Str. Nimbus	"	Changed 7 p.m.	S.W.	32.5°			"	Barometer readings from ship's Aneroid.
3	39.3	34.7	37.00	30.140	30.200	30.170	Cirrus	"	Very Fine	S.W.	32°			"	Wind velocity about 20 m. an hour.
4	37.5	34.0	35.75	30.210	30.210	30.210		Low Skies	"	S.W.	33°			"	"
5	53.0	34.0	43.50	30.110	30.112	30.111	Stratus	Fine	"	S.W.	32.5°			"	"
6	42.2	39.9	41.05	30.040	30.150	30.095	Str. & Nimb.	"	"	W.	34°			"	"
7	44.5	39.0	41.75	30.100	30.120	30.110	Cirro-Cum.	"	"	W.	32°			"	"
8	53.0	47.2	50.10	30.405	30.405	30.405	Alto-Cum.	"	"	S.	32°			"	"
9	58.8	40.0	49.40	30.072	30.455	30.263	Cirrus	"	"	N.W.	32°			"	Wind velocity about 30 m. an hour.
10	51.1	33.0	42.05	30.410	30.299	30.354	Alto-Cum.	"	"	E.	32°			"	"
11	44.2	39.3	41.75	30.125	30.398	30.262	Str. & do.	Foggy	Cleared 6 p.m.	S.W.	32°			"	Refraction very strong. Objects seen from a distance looking much larger than their actual size.
12	41.5	35.9	38.70	30.320	30.352	30.336		Fine	"	S.W.	32°			"	"
13	44.9	32.5	38.70	30.050	30.100	30.075	Overcast	Foggy	Clearer	S.W.	32°			"	"
14	44.9	32.6	38.75	30.120	30.110	30.115	"	"	Rainy	N.E.	35°			"	"
15	44.9	36.9	40.90	30.037	30.049	30.043	"	"	Damp	E.	37°			Lancaster	Lat. N. 72° 35' Long. W. 76° 48'
16	44.9	32.0	38.45	30.010	29.838	29.924	Alto-Cum.	Clear	Foggy	S.	31°			"	" 74° 30' " 80° 45' Rained from 2 a.m. to 12
17	35.7	32.0	33.85	29.750	29.750	29.750	p.m., overcast	Clear	"	S.	31°			"	" 74° 19' " 86° 30'
18	36.0	31.9	33.95	29.751	29.751	29.751	Alto-Cum.	Foggy	"	N.W.	32°			"	" 74° 20' " 87° 52' " 1 a.m. to 10.30 p.m.
19	48.8	29.0	35.90	29.700	29.620	29.660	Cum. & Cir.	Clear and	Bright	N.W.	31°			"	" 74° 45' " 91° 50'
20	37.0	32.8	34.90	29.580	29.610	29.595	Overcast	"	"	N.E.	33°			"	do
21	37.6	33.4	35.50	29.700	29.800	29.750	"	Foggy	"	E.	31°			"	" 74° 36' " 94° 05'
22	37.4	33.1	35.25	29.800	29.812	29.805	"	"	"	"	30°			"	" 74° 07' " 94° 06' Rain 8.15 to 9 p.m.
23	39.9	33.8	36.85	29.815	29.800	29.808	"	"	"	"	31°			"	" 74° 08' " 94° 35'
24	42.0	33.2	37.60	29.768	29.740	29.754	a.m. p.m. Cum. Strat.	Clear and	Cleared 7 p.m.	E.	31°			"	" 74° 40' " 95° 21'
25	34.0	29.7	31.85	29.720	29.790	29.755	Cum. & Stra.	Clear and	Bright	N.	31°			"	" 75° 10' " 97° 10'
26	32.9	30.8	31.85	29.740	29.720	29.730	Overcast	"	"	N.	31°			"	" 74° 56' " 96° 46'
27	33.4	31.1	32.25	29.660	29.689	29.675	"	Changing	Foggy	N.W.	31°			"	" 75° 00' " 99° 55' Snow flurries 8 p.m.
28	28.9	25.0	26.95	29.548	29.612	29.580	"	Foggy	"	N.W.	30.5°			"	" 75° 20' " 103° 20' Snow flurries all p.m.
29	31.8	25.0	28.40	29.742	29.803	29.773	Cumulus	"	Clearing	S.	28°			"	" 75° 15' " 104° 32' Rainbow 6 to 8.15 p.m.
30	31.0	24.7	27.85	29.748	29.702	29.725	Stra. & Cum.	"	"	S.	30°			"	" 75° 11' " 105° 10'
31	32.1	24.8	28.45	29.710	29.795	29.753	"	Fine	"	S. T'ng N.	30°			"	" 74° 50' " 107° 20' Snow flurries all p.m.
Sums	1265.81027	51146.65	927.942	298.962	298.962	298.962	Cumulus	Changing	"	N.	970°			Winter hr.	" 74° 17' " 110° 48' " 6 to 8 p.m.
Means	40.83	33.15	36.99	29.933	29.966	29.950					31.6°				

MONTH OF SEPTEMBER, 1910

Day of Month	Fahrenheit			Barometer			Clouds	Gen'l State of Weather		Wind	Temp. of Surface of Sea-water	Ice-Thickness	Snow-Depth	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Range	Morning	Evening	Mean		Midnight to Noon	Noon to Midnight						
1	32.3	27.0	29.65	29.970	30.059	30.0145	a.m. Cum.	Very Fine	From 4 p.m. Foggy	N.E.	30°			Winter harbour.	Depth of snow was taken on the ice all winter, and measured every Saturday. 6 to 7½ p.m. Snow-furries.
2	31.2	26.9	29.05	29.879	29.698	29.7885	Cir. & Str. Cum	"	Fine	S.E.	30°			Steaming towards Banksia.	
3	32.8	27.0	29.90	29.955	30.035	29.9950	Cumulus	Partly Overcast	"	Calm	30°			Coming back through Barrow st., Lancaster sound and Admiralty inlet to Arctic bay	5 to 6.30 p.m. Snow-furries.
4	29.6	25.0	27.30	30.080	30.114	30.0970	"	Very Fine	Overcast	S.W.	30°				
5	32.7	26.1	29.40	30.080	30.015	30.0475	Heavy Cum.	"	From 4 p.m. Overcast	W.	29°				
6	33.0	29.1	31.05	30.000	30.098	30.0490	Overcast	Foggy	Damp	N.	28°				1 a.m. to 5 a.m. Snow.
7	28.9	22.0	22.95	29.900	29.696	29.7980	"	Snowing	Snow & Fog.	S.E.	27°		2"		10 a.m. to 5.30 p.m. Snow.
8	24.2	19.6	21.90	29.500	29.420	29.4600	Str. & Cum.	Cleared 2 a.m.	Very Fine	N.	27°				Velocity of wind about 50 m. an hour
9	30.0	24.3	27.15	29.350	29.400	29.3750	Overcast	Wind, Fog, & Snow Flurr.	"	N.	27°				" " " 50 " "
10	34.8	25.0	29.90	29.500	29.470	29.4350	Cir. & Cum.	Clear, Fine	"	N.E.	28°				Wintering Harbour.
11	29.2	23.0	28.60	29.400	29.430	29.4150	Stratus	"	"	"	28°				Barometer set at sea-level. Where placed thermometer varied from 50° to 54° F., never going above or below. Standard Barometer from Toronto Observatory was used till the 21st July, 1911. On sea, readings were taken from ship's Aneroid, 6' above sea-level, 5 a.m. to 10 a.m., Snow furries.
12	25.9	22.1	24.00	29.440	29.430	29.4350	Cumulus	"	"	W.	29°				Lat. 73° 01' 35" N. Long. 84° 09' 00" W.
13	28.0	24.6	27.30	29.420	29.526	29.4730	Cir. & Strat.	"	"	"	29°				"
14	30.4	25.2	27.80	29.700	29.719	29.7095	Cloudless	"	"	"	29°				"
15	32.0	25.8	28.90	29.990	29.819	29.9045	Cumulus	"	"	S.W.	29°				"
16	31.5	25.1	28.30	29.710	29.724	29.7170	p.m., do.	"	"	W.	29°				"
17	36.1	25.0	30.55	29.932	30.102	30.0170	Light cum.	"	"	"	29°				"
18	32.1	25.0	28.55	30.026	29.990	30.0080	Cloudless	"	"	"	29°				"
19	28.1	23.0	25.55	29.780	29.580	29.6800	Cirrus	"	"	E.	29°				"
20	28.3	24.4	26.35	29.544	29.600	29.5720	Light Cum.	Overcast	"	"	29°				"
21	24.0	21.8	22.90	29.688	29.888	29.7880	Cumul.	Fine	"	S.E.	29°				"
22	23.0	18.3	20.65	29.766	29.780	29.7730	"	Overcast	"	S.W.	29°				"
23	26.9	18.0	22.45	29.870	29.820	29.8450	Overcast	Damp and Very Fine	Low Skies	S.E.	29°				"
24	27.0	23.8	25.40	29.929	29.882	29.9055	Cloudless	"	Very Fine	S.W.	29°				"
25	29.5	24.0	26.75	29.871	29.876	29.8735	Light Cum.	"	"	E.-N.E.	29°				"
26	32.0	29.1	30.55	29.942	29.964	29.9530	"	"	"	E.	29°				"
27	32.0	29.0	30.50	29.941	29.950	29.9455	Cloudless	"	"	S.E.	29°				"
28	32.2	22.0	27.10	29.972	30.050	30.0110	"	"	7 to 12 p.m. Overcast	"	29°				"
29	28.0	15.0	21.50	30.360	30.009	30.1845	Low Strat.	"	Very Fine	E.	28°				"
30	27.1	9.0	18.05	29.735	29.462	29.5985	Cloudless	"	"	W.	28°				"
31	88.58	711.2	798.0	894.046	93.656	893.8510					840°				"
Sums	29.5	23.7	26.6	29.8015	29.7885	29.795					28°				"
Means															"

Some 5 inches of snow fell during the month, but it packs and hardens so readily that the last measurement only gave 2 inches.

Thermometers set 12 ft. above sea-level.

Barometer set at sea-level. Where placed thermometer varied from 50° to 54° F., never going above or below. Standard Barometer from Toronto Observatory was used till the 21st July, 1911. On sea, readings were taken from ship's Aneroid, 6' above sea-level, 5 a.m. to 10 a.m., Snow furries.

1 a.m. to 5 a.m. Snow.
10 a.m. to 5.30 p.m. Snow.
Velocity of wind about 50 m. an hour

5 to 6.30 p.m. Snow-furries.

Depth of snow was taken on the ice all winter, and measured every Saturday. 6 to 7½ p.m. Snow-furries.

MONTH OF OCTOBER, 1910

Day of Month	Fahrenheit			Barometer			Gen'l State of Weather		Wind	Temp. Surface Water	Ice- Thickness	Depth of Snow	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Range	Morning	Evening	Mean	Midnight to Noon	Noon to Midnight						
1	28.0	7.7	17.85	29.969	29.848	29.909	Very Fine	Bright	W.	28°	4"		Arctic bay	Readings below zero marked minus -
2	17.6	7.5	12.55	29.826	29.920	29.874	Dull, Snow	Low Sky	"	28°				4 a.m. to 6 a.m. Snow flurries.
3	12.0	9.9	10.95	29.998	29.829	29.914	"	"	N.W.	28°				
4	26.8	10.1	18.45	29.740	29.800	29.770	Low Skies,	Snowing	S.W.	28°				7 a.m. to 5 p.m. Snow. Fall, 1 inch.
5	26.9	10.1	18.50	29.949	30.090	30.019	Fine	Dull	W.	28°				
6	21.0	9.0	15.00	30.222	29.882	30.053	Clear and	Fine	S.W.	28°				
7	18.0	-1.0	9.50	29.780	29.755	29.768	"	Cloudy	Calm	28°				
8	11.1	6.0	8.55	29.792	29.863	29.827	Low Skies	Cloudy	W.	27°				
9	13.8	-4.4	4.70	29.968	30.669	30.318	Bright and	Clear	S.W.	28°				10 a.m. to 2 p.m. Light fall of snow.
10	14.5	5.5	10.00	29.988	29.665	29.826	Dull, Snow	Low Skies	Calm	28°	6"			Ice only 2" outside Harbour. 7 a.m. to 11 a.m. Snow flurries.
11	15.5	4.0	9.75	29.900	29.930	29.915	"	"	S.W.	28°				4 a.m. to 10 a.m. Light fall of snow.
12	16.8	8.4	12.60	29.820	29.700	29.760	"	"	"	28°				1 a.m. to 4 a.m. Light fall of snow.
13	11.0	-2.9	4.05	29.700	29.620	29.660	Very Fine	Very Fine	N.W.	28°				Mock suns seen
14	10.4	-4.4	3.00	29.760	29.760	29.760	"	"	Calm	28°				every night before
15	10.2	-9.3	0.45	30.000	29.950	29.975	"	"	"	28°				Sunset. Arcs coloured
16	12.5	-8.5	2.00	30.020	30.020	30.020	"	"	"	28°				like a rainbow.
17	13.2	-9.1	2.05	30.000	29.860	29.930	"	Cloudy	N.W.	28°	8½"			Horizon.
18	10.0	7.8	8.90	30.000	29.850	29.925	Dull, Snow	Low Skies	Calm.	28°				5 p.m. to midnight. Light fall of snow.
19	7.5	-7.5	0.00	29.950	29.830	29.890	"	Fine	S.-S.E.	28°				Midnight to 6 a.m. Intermittent snowfalls.
20	12.1	-15.3	-1.60	29.700	29.680	29.690	Very Fine	Very Fine	Calm	27°				6 a.m. to 8 a.m. Intermittent snowfalls.
21	8.0	-6.0	1.00	29.750	29.720	29.735	"	Cloudy	"	28°				
22	-2.0	-14.1	-6.05	29.800	29.750	29.775	"	Very Fine	"	27°	3½"			5 a.m. to 7 a.m. Snow
23	-2.0	-16.3	-9.15	29.850	29.800	29.825	"	Cloudy	"	27°				
24	1.5	-7.2	-2.85	30.000	29.880	29.940	Low Skies	Low Skies	"	28°	11"			From the 10th, observations taken by third officer, E.J.
25	2.0	-7.0	-2.50	30.060	30.050	30.055	Fine and Clear	Low Skies	N.-N.W.	27°				Macdonald, using ship's Aneroid Barometer.
26	2.5	-6.1	-1.80	30.170	30.080	30.125	Foggy	Foggy	Var.	28°				
27	-2.0	-15.1	-8.55	30.350	30.300	30.325	Bright and	Clear	N.-N.W.	28°				
28	2.5	-17.4	-7.45	30.300	30.000	30.150	"	Cloudy	N.-N.W.	28°				
29	18.0	-12.3	2.85	29.550	29.300	29.425	Low Skies	Low Skies	N.	28°	13"			
30	19.5	8.2	13.85	29.450	29.700	29.575	Fine	Fine	"	28°				
31	17.2	6.0	11.60	29.880	30.000	29.940	Dull and	Low Skies	Calm	29°				
Sums.	378.1	-63.7	157.20	927.245	925.991	926.618								
Means	+12.6	-2.12	+5.24	29.917	29.870	29.893								

MONTH OF NOVEMBER, 1910

Day of Month	Fahrenheit			Barometer			Clouds	Gen'l State of Weather		Wind	Temp. Surface Sea-water	Ice Thickness.	Snow Depth.	Locality	GENERAL REMARKS.
	Maxi-mum	Mini-mum	Range	Morning	Evening	Mean		Midnight to Noon	Noon to Midnight						
1	13.2	5.9	9.55	30.100	30.200	30.150	Cir.-Cum. p.m.	Hazy and Cloudy	Cloudy	N.	28°		3 1/4"	Arctic bay	Readings below zero marked minus, -
2	3.0	1.5	2.25	30.150	30.150	30.150	Cirrus a.m.	Cloudy	Clear	"	28°			Lat. 73°01'35"N.	2 moek suns at Sunset. Upper part of
3	10.2	5.5	7.85	30.300	30.400	30.350	Overcast	Hazy, Foggy and Low Skies	"	"	28°			"	are very faint. Rainbow colours.
4	9.9	2.7	6.30	30.460	30.600	30.530	"	"	"	"	28°			"	
5	10.8	6.8	8.80	30.650	30.820	30.735	"	"	"	N.E.	28°			Long.	8 a.m. to 2 p.m. Snow blizzard.
6	9.0	1.5	5.25	30.800	30.850	30.825	Partly Overc't	"	Clear	N.	28°			"	
7	0.0	-6.1	-3.05	30.600	30.700	30.650	"	Cloudy	Bright	"	28°	14"		"	
8	18.5	7.1	12.80	30.500	30.550	30.525	Cumulus	"	Cloudy	S.	28°			"	
9	13.2	7.9	10.55	30.500	30.580	30.540	"	"	"	N.	28°			"	
10	2.0	-5.1	-1.55	30.600	30.600	30.600	Stratus a.m.	"	Low Skies	S.	28°	14 1/2"		"	1 p.m. to midnight
11	15.1	10.3	12.70	30.550	30.600	30.575	Overcast	Low Skies, Hazy and Foggy, with occasional snow-fall s. damp and Snow.	"	Var.	28°		"	"	Stormy weather
12	8.9	0.0	4.45	30.550	30.550	30.550	"	"	"	S.W.	28°			"	Midnight to 2 p.m.
13	12.5	5.1	8.80	30.400	30.500	30.450	"	"	"	S.-S.E.	28°			"	1 p.m. to 3 p.m.
14	10.7	8.0	9.35	30.380	30.400	30.390	"	"	"	"	28°			"	5 a.m. to 8 a.m.
15	8.0	1.5	4.75	30.300	30.340	30.320	"	"	"	S.W.	28°			"	sleet,
16	9.6	3.0	6.30	30.180	30.220	30.200	"	"	"	N.W.	28°		4 1/2"	"	9 a.m. to midnight
17	9.0	6.4	7.70	30.180	30.200	30.190	"	Cloudy	Cloudy	Calm	28°			"	hail and
18	8.6	1.0	4.80	30.180	30.200	30.180	Stratus	Clear	"	Var.	28°			"	wind.
19	3.3	-6.8	-1.75	30.240	30.240	30.240	Few Strat.	Bright and Overcast.	Clear	S.W.	28°			"	Midnight to 4 p.m.
20	15.0	-2.0	6.50	30.180	30.180	30.180	"	"	"	S.	28°			"	2 moek suns at sunset. Semi-circles brightly coloured.
21	10.0	16.0	13.00	30.100	30.080	30.090	"	Clear Skies	Fine and Clear	S.-S.E.	28°			"	
22	7.0	-2.0	2.50	30.200	30.200	30.200	Overcast	Part. Ov't	Partly Overc't	"	28°			"	
23	15.0	13.0	14.00	30.150	30.100	30.125	"	Stormy	Stormy	S.	28°			"	Snow flurries.
24	15.1	12.0	13.55	30.083	30.080	30.0865	"	Damp and raw	Damp and raw	Calm	28°			"	Observations were taken by Mr. E. J. MacDonald, third
25	11.6	13.8	12.70	30.302	30.301	30.301	"	Stormy with intermittent	Stormy with intermittent	W.	27°			"	officer, to the 25th.
26	11.8	-10.0	0.90	30.400	30.600	30.500	"	Snow flurries and fogs,	Snow flurries and fogs,	Calm	27°			"	
27	7.8	-1.2	3.30	30.650	30.700	30.675	"	low skies	low skies	"	27°			"	
28	6.7	-3.3	1.70	30.762	30.840	30.801	"	very dull	very dull	W.	27°			"	
29	5.9	-3.0	1.45	30.802	30.829	30.8155	"	"	"	"	27°			"	
30	8.9	6.8	7.85	30.740	30.683	31.7165	"	"	"	"	27°	16 1/2"		"	1st to 25th Barometer readings from Aneroid.
Sums	290.3	96.3	193.30	911.989	913.292	912.6405									
Means	+9.68	+3.21	+6.44	30.3996	30.443	30.4213									



MONTH OF DECEMBER, 1910

Day of M th	Fahrenheit		Barometer			Clouds	Gen'l State of Weather		Wind	Temp. Surface, Sea-water	Ice-Thickness	Depth of Snow	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Range	Morning	Evening		Mean	Midnight to Noon						
1	-0.2	-2.2	-1.20	30.681	30.676	30.6785	Nil	Very foggy	Clearing 11 p.m.	Calm	27.5°		Arctic bay	When below zero, degrees marked minus (-)
2	-7.2	-13.0	-10.10	30.680	30.319	30.4995	"	Clear	Clear	N.	28°	5"	Lat. 73° 01' 35" N. Long. "	Snow drifting at night Daylight from 10 a.m. to 2 p.m. Snow drifting at night.
3	0.3	-15.9	-7.80	30.139	30.049	30.0940	Overcast	Stormy & Clear	Windy	S.W.			"	
4	-2.0	-3.4	-2.70	30.029	30.052	30.0405	Nil.	Clear	Clear	Calm			"	
5	6.8	-6.0	0.40	29.501	29.868	29.6845	Overcast	Stormy & Clear	Windy	S.E.	28°		"	
6	5.3	0.0	2.65	29.740	29.783	29.7615	Nil	Clear	"	S.			"	
7	3.1	-0.4	1.35	29.819	29.900	29.8595	Overcast	Foggy, Snow	Blizzard	S.E.			"	
8	-10.2	-8.1	-9.15	29.835	29.750	29.7925	"	Foggy	"	N.W.	28°	6"	"	Hardly any daylight, even at noon. 1 p.m. to 4 p.m. Snow blizzard.
9	-9.8	-19.8	-14.80	29.763	29.966	29.8645	Nil	Clear	Clear	N.W.			"	
10	-28.0	-31.9	-29.95	30.110	30.123	30.1165	"	"	"	Calm	27.5°		"	
11	-31.0	-37.7	-34.35	30.288	30.172	30.2300	"	"	"	"			"	
12	-34.0	-35.9	-34.95	30.203	30.147	30.1750	"	"	"	"			"	
13	-30.3	-37.0	-33.65	30.113	30.127	30.1200	"	"	"	N.			"	
14	-34.0	-39.9	-36.95	30.133	30.169	30.1510	"	"	"	"	27.5°	6"	"	Large bright halo round the Moon. Sun below horizon all day.
15	-26.8	-39.0	-32.90	30.144	30.041	30.0925	"	Skies Low	"	Calm			"	
16	-28.7	-32.0	-30.35	30.009	30.052	30.0305	"	Clear	"	"			"	
17	-22.9	-34.4	-28.65	30.012	29.915	29.9635	"	"	"	"			"	
18	-22.5	-35.0	-28.75	29.750	29.699	29.7245	"	"	"	"	27.5°	24½"	"	2 mock moons from 4 a.m. to 10 a.m.
19	-28.2	-34.9	-31.55	29.628	29.564	29.5960	"	"	"	N.			"	
20	-28.0	-40.7	-34.35	29.653	29.759	29.7060	"	"	"	"			"	
21	-30.2	-38.7	-34.45	29.634	29.506	29.5700	"	"	"	"			"	
22	-24.0	-38.9	-31.45	29.501	29.407	29.4540	"	"	"	"			"	
23	-34.0	-40.0	-37.00	29.460	29.590	29.5250	"	Fine	Snow Blizzard	E.			"	
24	-40.0	-48.5	-44.25	29.796	29.960	29.8780	"	"	Clear	N.	28°	6"	"	Faint Aurora Borealis 9 to 10 p.m.
25	-25.0	-40.0	-32.50	29.869	29.720	29.7945	"	"	"	Calm			"	
26	-22.6	-23.4	-23.00	29.850	29.828	29.8390	"	"	"	W.			"	
27	-33.0	-34.9	-33.95	29.734	29.751	29.7425	"	"	"	Calm			"	
28	-18.9	-34.0	-26.45	29.739	29.777	29.7580	"	"	"	"			"	
29	-15.0	-25.3	-20.15	29.664	29.618	29.6410	"	"	"	S.E.			"	
30	-29.2	-31.3	-30.25	29.841	29.929	29.8850	"	"	"	"	28°	6"	"	Strong wind. p.m. N. wind about 20 miles an hour.
31	-19.9	-43.4	-31.65	29.692	29.371	29.5315	"	"	"	E.			"	
Sums	620.1	856.6	742.85	927.010	928.588	926.7990				Calm				
Means	-20.0	-27.02	-23.96	29.9036	29.8899	29.8968					250°	6"		
											27.7°	6"		

MONTH OF JANUARY, 1911

Day of M th	Fahrenheit		Barometer		Clouds	Gen'l State of Weather		Wind	Temp. Surface Sea-water	Ice-Thickness	Depth of Snow	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Morning	Evening	Mean	Midnight to Noon	Noon to Midnight						
1	2.0	-20.0	-9.00	29.050	29.224	29.1370	Heavy Gale of Wind	N.W.				Arctic bay	Wind velocity about 30 m. an hour, lasting till 1 p.m. on the 2nd
2	-18.1	-20.0	-19.05	29.398	29.459	29.4285	Fine	"				Lat. 73°01'35"N. Long.	2 hours of daylight
3	-35.2	-35.3	-35.25	29.509	29.663	29.5860	Nil	"				"	
4	-41.4	-44.0	-42.70	29.773	29.815	29.7940	"	"				"	
5	-44.9	-48.2	-46.55	29.754	29.744	29.7490	"	"				"	
6	-38.0	-47.0	-42.50	29.593	29.530	29.5645	"	"				"	
7	-30.3	-40.0	-35.15	29.402	29.601	29.5315	Low Skies	"	27.5°	28"		"	Heavy wind.
8	-17.7	-32.1	-24.90	29.844	30.170	30.0070	Overcast	Cloudy				"	10 p.m. A.B. narrow ribbon of light, going from W. East to West pale white.
9	-27.1	-28.10	30.251	30.274	30.2625	Fine	"	"				"	
10	-21.6	-32.0	30.224	30.133	30.1785	"	Stormy	N.W.				"	
11	-22.3	-24.6	-23.45	30.063	29.894	29.9785	Very Stormy till 6 p.m.	W.				"	8 a.m. to 6 p.m. snow-storm. Wind velocity approx. 35 m. an hour.
12	-33.4	-40.1	-36.75	29.697	29.371	29.5340	Partly O'cast	"				"	2 a.m. to 2 p.m. snow-storm. Wind velocity approx. 25 m. an hour. Fell in p.m.
13	-5.3	-35.9	-20.60	28.780	28.959	28.8695	a.m. Gale	"				"	3 a.m. to 5 a.m. snow-storm. During p.m. snow drifting.
14	-18.6	-21.0	-19.80	29.176	29.283	29.2295	Snow	Stormy	29°	28"		"	
15	-29.5	-30.4	-29.95	29.588	29.665	29.6265	Flurries	Partly Over-cast				"	6 a.m. to 7.30 a.m. snowing.
16	-22.5	-35.2	-28.85	29.639	29.651	29.6450	Clear, Fine	S.W.				"	
17	-32.5	-35.7	-34.10	29.587	29.300	29.4435	Low Skies	S.				"	
18	-38.6	-45.0	-41.80	29.329	29.461	29.3950	Fine	Var.				"	6 p.m. A.B. from N. to W. Not brilliant.
19	-36.3	-48.0	-42.15	29.550	29.588	29.5690	"	"				"	
20	-16.1	-35.9	-26.00	29.559	29.580	29.5695	Hazy, Dull	Calm				"	
21	-22.5	-26.9	-24.70	29.557	29.359	29.4580	Fine	S.E.				"	
22	-25.0	-33.1	-29.05	29.268	29.311	29.2895	Interm. Fogs	N.E.				"	
23	-30.9	-34.2	-32.55	29.300	29.435	29.3675	"	Calm	28°	31"		"	
24	-37.7	-40.9	-39.30	29.569	29.737	29.6530	"	"				"	
25	-41.0	-48.7	-44.85	29.902	30.040	29.9710	"	"				"	
26	-45.0	-47.2	-46.10	30.069	30.125	30.0970	"	"				"	
27	-48.9	-50.4	-49.65	30.124	30.031	30.0775	"	"				"	
28	-50.6	-53.0	-51.80	29.881	29.840	29.8605	"	"				"	8 p.m. A.B. only a few minutes above the horizon, and running from S. to W. Display weak.
29	-44.1	-48.0	-46.05	29.901	30.522	30.2115	"	"				"	The entire horizon purpled by the sun's twilight from 11 a.m. to 1 p.m.
30	-44.1	-51.9	-48.00	30.102	30.011	30.0565	Hazy till 7 p.m.	W.				"	
31	-40.9	-46.3	-43.60	29.583	29.044	29.3135	"	Calm				"	
Sums	958.1	1180.1	1069.1	919.088	919.820	919.4540							
Means	-30.9	-38.1	-34.5	29.648	29.6716	29.6598							

MONTH OF FEBRUARY, 1911

Day of M th	Fahrenheit		Barometer		Clouds	Gen'l State of Weather		Wind	Temp.-Surface-water	Ice Thickness	Snow Precip.	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Range	Mean		Midnight to Noon	Noon to Midnight						
1	-40.1	-46.8	43.45		6 a.m. to 6 p.m.	Fine	Partly Dull	W.		8 1/2"	Arctic bay	Arctic bay Lat. 73°01'35" N. Long.	From 1st to 5th, when clear, the whole horizon purpled by the sun's twilight from 11 a.m. to 1.30 p.m. On the 2nd A.B. at 10 p.m. in S.W. packed by the wind.
2	-40.2	-42.3	41.25		Few Stratus Cir.-Cum. E. Str.-Cum. N. and S.	Hazy	Overcast and Foggy	Calm					
3	-40.0	-49.1	44.55		Cumulus	Overcast & Foggy	Snow Flurries.	W.					
4	-35.5	-43.7	39.60	29.952	"	Foggy till Fine	10 p.m. Fine	N.E. Calm	28°	35 1/2"	"	"	
5	-46.0	-50.8	48.40	30.293	Nil	"	"	"			"	"	
6	-52.0	-55.0	53.50	30.451	"	"	"	"			"	"	Sun's upper limb seen above mts. Had been seen on the 2nd inst. in Admiralty Inlet.
7	-47.0	-55.2	51.10	30.320	"	"	"	"			"	"	
8	-45.0	-52.4	48.70	30.329	2 to 3 p.m. Few Stratus	"	"	W.			"	"	Sun's entire orb seen.
9	-35.1	-49.0	42.05	30.327	Stratus	"	"	Calm	36"		"	"	
10	-35.0	-42.2	38.60	30.091	Nil	"	"	"			"	"	
11	-39.0	-41.1	40.05	30.061	Few Stratus	"	"	"			"	"	
12	-40.0	-44.0	42.00	30.149	Nil	"	"	"	28°	8 1/2"	"	"	
13	-42.3	-31.1	21.70	29.932	Cumulus	Foggy Stormy	Stormy Fine	S.E. W.			"	"	Snow flurries all day. Wind about 25 m. per hour.
14	-19.3	-24.0	21.65	29.822	" 5 p.c.	Intermit- tent	Fogs	E.			"	"	Wind about 30 m. " "
15	-24.0	-36.9	30.45	30.269	Cumulus	"	"	"			"	"	
16	-19.1	-26.9	23.00	30.250	Nil	Fine and "	Clear	Calm			"	"	Sun showing above horizon at 10 a.m. local time.
17	-9.3	-30.5	19.90	30.245	Str. & Cum.	"	Foggy	"			"	"	
18	-6.4	-25.2	15.80	30.036	Cumulus	Foggy	Overcast	W.	37"		"	"	
19	-8.0	-23.9	15.95	29.629	"	Low Skies	Dull, Hazy	Calm			"	"	
20	-2.5	-8.0	5.25	29.481	"	"	5 p.m., Clear- ing	"			"	"	
21	-4.0	-22.3	13.15	29.340	Nil	Clear	Partly Foggy.	S.E.			"	"	From 7 p.m. heavy West wind, turning S.E.
22	-7.0	-21.7	14.35	29.366	"	Dull, Hazy	"	Calm			"	"	Calm from 10 p.m.
23	-9.0	-18.8	13.90	29.649	"	Very Fine	Very Fine	"			"	"	8 p.m. Heavy West wind till 11 p.m.
24	-12.3	-29.9	21.10	29.489	"	"	"	"	28°	38"	"	"	A.B. at 9 p.m. going N.E. to S.
25	-10.2	-30.2	20.20	29.770	"	"	"	"			"	"	
26	-16.0	-32.5	24.25	29.916	"	"	"	"			"	"	
27	-19.7	-38.2	28.95	29.749	"	"	"	W.			"	"	A.B. in the South at 9 p.m.
28	-29.1	-41.0	35.05	29.566	"	"	"	Calm			"	"	A.B. in the South at 11 p.m.
Sums	703.1	1012.7	857.9	837.676									
Means	-25.11	-36.17	-30.64	29.917					28°	38"	7 1/2"		

MONTH OF MARCH, 1911

Day of month	Fahrenheit		Barometer		Clouds	Gen'l State of Weather		Wind	Temp. Surface Water	Ice-Thickness	Depth of Snow	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Range	Morning		Evening	Mean						
1	-24.0	-43.2	-33.60	29.639	29.668	29.6535	Very Fine	and Clear	Calm			Arctic bay	Lat. 73° 01' 35" N. Long.
2	-24.3	-43.7	-34.00	29.779	29.818	29.7985	"	"	"			"	
3	-34.0	-44.1	-39.05	29.875	29.953	29.9140	"	"	"			"	
4	-26.7	-42.0	-34.35	29.819	29.699	29.7590	"	"	"			"	
5	-31.3	-43.2	-37.25	29.651	29.752	29.7015	"	"	N.			"	Splendid Aurora Borealis extending from N.W. to S.E. touch- ing the horizon, dividing in four branches at zenith. Stream- ers giving vivid flashes, but not changing their shape.
6	-29.5	-43.1	-36.30	29.739	29.575	29.6520	"	"	"			"	All white except at zenith, where pale yellow and pink.
7	-17.0	-39.5	-28.25	29.309	29.409	29.3590	"	"	"			"	Began about 8 p.m.
8	-21.8	-41.0	-31.40	29.680	29.932	29.8060	"	"	Calm			"	
9	-28.7	-42.0	-35.35	30.051	30.195	30.1230	Partly Overcast	"	"			"	
10	-15.3	-43.6	-29.45	30.148	30.085	30.1165	Very Fine	"	"			"	
11	-13.9	-38.0	-25.95	30.515	30.020	30.2675	"	"	"			"	
12	-15.0	-42.8	-28.90	29.989	30.103	30.0460	"	"	"			"	
13	-15.4	-41.4	-28.40	30.062	29.750	29.9060	"	"	"			"	
14	-15.3	-39.7	-27.50	29.632	29.820	29.7260	"	"	"			"	
15	-14.5	-39.2	-26.85	30.021	29.782	29.9015	"	"	N.W.			"	Observations from the 15th taken by First Officer M. O. J. Morin.
16	-10.4	-39.9	-25.15	29.614	30.052	29.8330	Low Skies	and Hazy	Calm			"	
17	-21.8	-29.8	-25.80	30.054	29.884	29.9690	Few Stratus in South	Clear	"			"	
18	-10.0	-29.7	-19.85	29.232	29.052	29.1670	"	Low Skies	N.W.			"	Stormy from 5 p.m. to 1 a.m.
19	-5.1	-6.2	-5.65	29.252	29.320	29.2860	Snow Flurries	Snow Drifting	S.E.			"	Heavy S.E. gale 2 a.m. to 12.
20	-13.2	-16.9	-15.05	29.518	29.523	29.5205	Overcast	Cloudy	Calm			"	
21	-3.4	-20.8	-12.10	29.706	29.802	29.7540	"	Overcast	"			"	
22	-9.2	-18.7	-13.95	29.724	29.753	29.7385	Snow Drift- ing with	W.N.W. Wind	W.N.W.			"	
23	-15.2	-25.4	-20.30	29.756	29.683	29.7195	Clear and	Fine	W. p.m.			"	8 a.m. to 12, N.W. wind, veering W. in p.m. Strong.
24	-16.3	-32.2	-24.25	29.838	29.956	29.8970	"	Foggy	N.W. p.m.			"	
25	-15.4	-32.8	-24.10	29.924	29.911	29.9175	"	Fine	S.			"	
26	-11.4	-31.7	-21.55	30.006	30.102	30.0540	"	"	Calm			"	
27	-12.0	-32.3	-22.15	30.005	29.972	29.9885	"	"	"			"	
28	-9.3	-26.4	-17.85	29.850	29.782	29.8160	Overcast	Snow Flurries	"			"	
29	-5.2	-18.8	-12.00	29.980	30.100	30.0400	Fine and	Clear	"			"	
30	-11.5	-30.4	-20.95	30.062	30.063	30.0625	"	"	"			"	
31	-7.8	-31.3	-19.55	30.252	30.422	30.3370	"	"	"			"	
Sums	503.9	1049.8	776.85	924.782	924.938	924.8600							
Means	-16.25	-33.86	-25.06	29.8316	29.8368	29.8342							

MONTH OF APRIL, 1911

Day of M th	Fahrenheit		Barometer			Clouds	Gen'l State of Weather		Wind	Temp. Surface Sea-water	Ice- Thickness	Depth of Snow	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Range	Morning	Evening	Mean	Midnight to Noon	Noon to Midnight						
1	-7.3	-25.2	-16.25	30.523	30.402	30.4625	Fine and Cloudy	Clear	Calm	28°	8½"	48"	Arctic bay Lat. 73° 01' 35" N.	Observations taken by 1st officer, Mr. O. J. Morin.
2	-5.3	-21.8	-13.55	30.112	29.985	30.0235	Cloudy	"	N.W.					
3	-6.2	-26.6	-16.40	29.880	29.628	29.7540	Fine and "	"	Calm					
4	-6.4	-27.2	-16.80	29.550	29.607	29.5785	"	"	"					
5	-8.5	-24.8	-16.65	29.610	29.612	29.6110	Snow Flurries	Cloudy	"					
6	-9.2	-22.9	-16.05	29.756	29.825	29.7905	Clear	"	N.W.					
7	+2.5	-17.3	-7.40	29.972	30.124	30.0480	Dark and Fine and	Low Skies	Calm					Light N.W. wind from 10 a.m. to 8 p.m. Snow from 4 a.m. to 2 p.m.
8	-9.4	-28.2	-16.80	30.150	30.212	30.1810	"	Clear	"					
9	-5.7	-29.7	-17.70	30.224	30.220	30.2220	"	"	"					
10	-3.4	-28.9	-16.15	30.502	30.500	30.5010	Low Skies	Threatening.	Var.					
11	+2.1	-16.3	-7.10	30.345	30.262	30.3035	Storm and Clearing	Snow Drift	N.W.					N.E. wind from 10 a.m. to 4 p.m., changing N.W. Strong gale and snow-storm.
12	-3.8	-15.4	-9.60	30.263	30.354	30.3085	Fine	"	Calm					Wind S. from 8 a.m. to noon.
13	21.7	5.6	13.65	30.554	30.625	30.5895	"	"	N.W.					
14	8.2	6.8	7.50	30.550	30.456	30.5030	Overcast	Low Skies	"					
15	13.5	9.8	11.65	30.126	29.984	30.0550	Dark, Low "	& Hazy Skies	S.E.					
16	26.4	20.2	23.30	30.064	30.123	30.0935	"	"	S.					
17	30.5	27.1	28.80	30.200	30.380	30.2900	Clearing Thaw	Fine	Calm					Snow from 4 a.m. to midnight. S.E. gale veering to South.
18	29.7	17.4	23.55	30.682	30.602	30.6420	"	"	N.W.					Occasional fogs in forenoon.
19	33.2	15.2	24.20	30.600	30.600	30.6000	Low Skies	Cloudy	Var.					Light variable rumup.
20	19.3	14.7	17.00	30.542	30.334	30.4380	"	"	S.E.					
21	28.5	20.5	24.50	30.160	30.102	30.1310	"	"	"					S.E. gale.
22	30.0	27.4	28.70	30.062	29.742	29.9020	Snow Drifting	"	"					
23	23.5	20.2	21.85	29.472	29.445	29.4585	"	Snow Drifting. Overcast	"					Heavy Snow-drift.
24	21.6	17.7	19.65	29.602	29.703	29.6525	Snow Flurries	"	"					
25	17.8	17.2	17.50	29.754	29.782	29.7680	"	"	N.W.					
26	19.3	14.5	16.90	29.845	29.883	29.8640	Fine and "	Snow Flurries	"					
27	11.6	10.3	10.90	29.973	30.083	30.0280	"	Clear	"					
28	15.2	9.5	12.35	30.145	30.201	30.1730	"	Partly Over- cast	"					Snow melting on the 17th, 18th, 19th and 22nd.
29	15.4	7.5	11.45	30.224	30.203	30.2135	"	"	"					
30	21.3	15.2	18.25	30.183	30.082	30.1325	"	Clear	"					
Sums	330.1	-7.5	161.25	903.625	903.011	903.3180								
Means + 11.0	-0.25	+5.375		30.1208	30.1004	30.1106								

MONTH OF MAY, 1911

Day of M th	Fahrenheit			Barometer			Clouds	Gen'l State of Weather		Wind	Temp. Surface Sea-Water	Ice-Thickness	Depth of Snow.	Locality	GENERAL REMARKS
	Maximum	Minimum	Range	Morning	Evening	Mean		Midnight to Noon	Noon to Midnight						
1	23.2	10.2	16.70	29.974	29.872	29.9230		Fine and Clear	Calm					Arctic bay	Observations taken by 1st officer, Mr. O. J. Morin.
2	28.3	16.3	22.30	29.763	29.673	29.7180		Overcast Snow Fogs	W.					Lat. 73°01'35" N.	
3	27.5	10.4	18.95	29.783	29.863	29.8230		Fine and Clear	N.W.					Long.	
4	16.6	-1.2	7.70	29.745	29.860	29.8025		"	"					"	10 a.m. to noon, snow flurries.
5	21.3	-9.3	6.00	29.763	29.776	29.7665		"	Calm			54"	11"	"	
6	20.5	4.5	12.50	29.564	29.702	29.6330		Skies dark and Cloudy	"					"	
7	18.2	4.8	11.50	29.646	29.701	29.6735		Snow Flur.	N.N.W.					"	Midnight to 2 p.m., snow flurries, and wind veering to N. E.
8	20.4	5.3	12.85	29.743	29.803	29.7730		Part. o'cast	N.E.					"	
9	30.2	4.8	17.50	29.880	29.973	29.9265		"	"					"	
10	24.8	1.3	13.05	30.000	29.958	29.9790		Fine and "	N.W.					"	
11	27.3	5.2	16.75	29.900	29.850	29.8750		"	Calm					"	
12	22.7	7.9	15.30	29.800	29.800	29.8000		Snow Flur.	Var.			56"	11 1/2"	"	Strong wind.
13	14.1	10.2	12.15	29.900	29.900	29.8500		"	Snow Flurries	W.				"	
14	20.3	10.4	15.35	29.982	30.072	30.0270		Overcast	Low Skies	Var.				"	
15	23.5	12.3	17.90	30.022	30.000	30.0110		"	Snow Flurries	S.E.				"	
16	20.8	15.5	18.15	30.000	30.000	30.0000		"	Dull and Hazy	Calm				"	
17	35.2	9.7	22.45	30.080	30.120	30.1000		Fine and "	"					"	
18	32.4	8.2	20.30	29.970	29.780	29.8750		"	Overcast	Var.				"	
19	27.9	16.8	22.35	29.542	29.363	29.4525		Overcast	Wet Snow	"				"	Wind var. and wet snow to midnight.
20	29.1	18.2	23.65	29.243	29.170	29.2065		Thick, Wet Snow	Snow Flurries	Calm		56"	11 1/2"	"	Snowed the whole day. Wet, melting snow.
21	24.8	14.3	19.55	29.380	29.600	29.4900		"	"	"				"	
22	28.4	10.2	19.30	29.802	29.950	29.8760		Flurries	"	W.				"	
23	24.8	17.1	20.95	29.981	29.950	29.9655		Hazy Snow	Clear	"				"	
24	30.0	16.9	23.45	29.832	29.821	29.8265		Flurries	Overcast	N.				"	
25	34.1	18.2	26.15	29.820	29.822	29.8210		Partly	Clear	"				"	
26	25.5	17.1	21.30	29.921	30.000	29.9605		Overcast	Cloudy	W.				"	
27	27.3	12.5	19.90	30.051	30.100	30.0755		"	"	"				"	
28	30.3	22.3	26.30	30.100	30.180	30.1400		Partly	Wet Snow	N.W.		28.3°	10"	"	
29	32.1	21.5	26.80	30.200	30.120	30.1600		Overcast	Snow Flurries	Calm				"	
30	36.3	27.2	31.75	29.953	29.923	29.9380		Wet Snow	Clear	"				"	
31	44.0	28.1	36.05	29.842	29.900	29.8710		Snow Flur.	Overcast	S.E.				"	Strong breeze.
								Partly Cloudy	Cloudy	"				"	
Sums	821.9	366.9	594.4	925.082	925.596	925.3390									
Means	26.51	11.83	19.17	29.8414	29.8579	29.8496									

MONTH OF JUNE, 1911

Day of Month	Fahrenheit		Barometer			Gen'l State of Weather		Wind	Temp. Sea-water Surface	Ice- Thickness	Depth of Snow	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Range	Morning	Evening	Mean	Clouds	Midnight to Noon	Noon to Midnight				
1	40.5	29.7	35.10	29.902	29.840	29.8710	Cumulus	Part o'cast	Cloudy	N.W.		Arctic bay	Lat. 73° 01' 35". Long.
2	39.1	32.1	35.60	29.903	29.950	29.9265	Heavy Cum.	Overcast	Overcast	Calm		"	Wet snow from 3 p.m. to 9 p.m.
3	44.0	33.9	38.95	29.930	29.910	29.9200		Dull and	Cloudy	N.W.	4"	"	Snow flurries part of the day
4	45.2	32.0	38.60	29.919	29.899	29.9090		Overcast	Overcast	Calm	52"	"	"
5	44.2	32.7	38.45	29.943	29.961	29.9520		"	"	N.W.		"	"
6	37.0	32.0	34.50	29.975	29.934	29.9545	p.m. Cum.	"	Cloudy & Fog	Calm		"	p.m. North horizon foggy.
7	34.6	30.1	32.35	29.849	29.691	29.7700	Strat.	Very bright	Overcast	N.W.		"	Snow flurries 6 p.m. to 8 p.m.
8	47.3	32.5	39.90	29.637	29.709	29.6735	p.m. Cum.	Overcast	Sunny	Calm		"	2 a.m. to 8 a.m. Wet snow.
9	50.8	30.9	40.85	29.987	30.125	30.0560	a.m. Cum.	Fine	Clear	"		"	Thermometer exposed to the sun—67°. Maximum temp. occurring at 4 p.m.
10	47.5	33.7	40.60	30.231	30.302	30.2665	Cum. till 4 p.m.	Part o'cast	"	N.W.	31°	"	Very damp wind.
11	44.2	35.3	39.75	30.249	30.143	30.1960	Few Cum. & Str.	Clear and	Bright	S.		"	1.30 p.m. to 6 p.m. rain.
12	41.2	37.0	39.10	30.038	29.964	30.0010		Overcast	Rain & Fog	S. Var.		"	Intermittent cloud-bursts.
13	36.4	34.5	35.45	29.949	29.999	29.9740		F'gy & Wet	"	N.W.	0"	"	Wind turned N.E. at 6 p.m.
14	45.6	32.0	38.80	30.009	30.032	30.0205	Sky deep Blue	Fine and	Fine and	E.		"	Wind turned N. by W. in p.m., 25 m. an hour.
15	42.9	32.4	37.65	30.092	30.103	30.0975	Alto-Cum. & Cir.-Nimb.	Sunny	"	"		"	Veered N.W. at 4 p.m. and W. at 5.30. Foggy and wet till 6 p.m. 2 to 4 p.m. snow blizzard. Cleared in evening.
16	39.2	30.0	34.60	30.103	30.049	30.0760		"	Variable	N.		"	Blowing about 20 m. an hour till 9 a.m.
17	42.3	33.8	38.05	30.088	30.202	30.1450	from 5 p.m. Heavy Cum.	Overcast	Fine & Windy	W.		"	10 p.m., snow blizzard.
18	41.0	36.8	38.90	30.208	30.140	30.1740	"	Cloudy	"	"		"	Rain 11 a.m. to 4 p.m. and 10 p.m. to 12 p.m.
19	38.7	34.1	36.40	30.102	30.039	30.0705		"	Foggy	S.W.		"	Wind changed E. at 5 p.m. Vel. 15 m. an hour.
20	42.4	34.1	38.25	29.990	29.929	29.9595		Thick Fog	& Snow Blizz.	N.W. by N.		"	p.m. and looking stormy.
21	40.0	31.8	35.90	29.870	29.829	29.8495		Fog & Snow	Occ. Showers	Calm		"	Rain, snow and fog lasting till 11 a.m.
22	39.6	34.7	37.15	29.939	30.007	29.9730		Rain, Snow	Fog & Wind	N.		"	Wind velocity 15 m. an hour. Sun shining at intervals.
23	42.0	34.5	38.25	30.080	29.992	30.0360	p.m. Cir. Cum.	Rain & Fog	Fine	N.W.		"	Very strong wind.
24	39.5	34.1	36.80	30.849	30.388	30.6185	Heavy Cum.	Occasional	Showers	S.E.		"	Very strong wind.
25	44.1	35.3	39.70	29.928	29.695	29.8115	Str. & Cir.	Fine	Fine	N.		"	Overcast in evening. p.m. heavy wind.
26	40.8	33.1	36.95	29.550	29.489	29.5195	p.m.	Overcast	Overcast	"		"	Gentle breeze.
27	42.2	33.3	37.75	29.479	29.475	29.4770	p.m. Cir-Nim.	"	Fine	N. by W.		"	Thick fog 9 to 12 p.m.
28	47.0	34.5	40.75	29.501	29.609	29.5550	a.m. Cum.	Fine	Overcast	N.		"	
29	50.5	32.9	41.70	29.780	29.835	29.8075	Cir.-Cum.	Very Fine	Fine	W.		"	
30	47.0	34.7	40.85	29.331	30.029	29.9800	a.m. Cir.-Cum. Nim.	"	Very Fine	N.		"	
Sums	1276.8	998.5	1137.65	899.011	898.269	898.6405							
Means	42.56	33.28	37.92	29.967	29.9423	29.9546							

MONTH OF JULY, 1911

Day of Month	Fahrenheit			Barometer			Clouds	Gen'l State of Weather		Wind	Temp. of Sea-water	Ice-Thickness	Depth of Snow	Locality	GENERAL REMARKS
	Maxi-um	Mini-um	Range	Morning	Evening	Mean		Midnight to Noon	Noon to Midnight						
1	44.8	31.5	38.15	30.049	29.891	29.9700		Fine till 8	O'cast, F gy.	N.W. & W.	32°	35"		Arctic bay	
2	47.0	35.7	41.35	29.792	29.565	29.6785	Cumulus	Overcast 10	Fine & Windy	W.				"	Drizzling rain from midnight to 9.30 p.m.
3	44.2	34.0	39.10	29.361	29.340	29.3505		Rain & Fog	Foggy	N. & N. to W.				"	Wind about 25 m. an hour. Verh heavy.
4	38.9	33.0	35.95	29.361	29.387	29.3740		Fine and Bright	Sunny, Gale	N.W.				"	" 25 " Wind falling.
5	42.0	32.0	37.00	29.439	29.529	29.4940			"	"				"	" 15 " every night
6	46.0	34.5	40.25	29.598	29.715	29.6565		Fine but very Windy	Very Windy	"	32.5°	24"		"	" 20 " at 10 o'clock, starting anew at 7 a.m.
7	53.4	30.2	41.80	29.741	29.685	29.7130		Fine	Very Fine	N. & N. to E.				"	Ice all honeycombed and rotten.
8	47.9	31.0	39.45	29.749	29.785	29.7670	Str. & Cir-Cum	Par. Foggy	"	N.N.W.				"	
9	48.0	38.2	43.10	29.836	29.890	29.8630	Heavy Cum.	Overcast	Heavy Wind	"				"	Ice began moving in bay.
10	41.0	34.1	37.55	29.850	29.848	29.8490		Very Fine	Very Fine	"		12"		"	
11	44.9	33.9	39.40	29.870	29.895	29.8825		"	"	"	33°			"	Ice holding fast in Adams sound and Admiralty inlet. Arctic Bay partly free of ice.
12	44.0	34.7	39.35	29.951	29.977	29.9640		"	"	"				"	N.N.W. wind sprang at 4 p.m. 12 to 1.30 p.m., rain.
13	45.9	34.6	40.25	30.080	30.132	30.1060	Cum. p.m.	Foggy	Clearing 5 p.m.	Calm	35"			"	Ice breaking in Adams sound. 5-12 p.m., fog.
14	40.1	35.0	37.55	30.151	30.145	30.1480	Thick Cum.	Very Fine	Fine	N.-N.W.				"	Started fires in engine.
15	43.0	36.3	39.65	30.199	30.209	30.2040	Cir-Cum.	Overcast	Damp & Raw	Calm				"	Therm. exposed to sun 67°. Left port. New ice formed on open water, same noticed often, although therm. above 32°.
16	41.1	36.7	38.90	30.219	30.345	30.2820		Very Fine	Very Fine	N. to W.				"	Wind veered N.-N.W. at 5 p.m.
17	49.1	36.0	42.55	30.440	30.430	30.4350		"	"	N.W.	36°			"	Very heavy ice-pressure 3 to 5 a.m. Pushed south by flow to opening of Adams sound.
18	50.9	35.5	43.20	30.430	30.333	30.3815		"	"	"				"	
19	52.6	36.0	44.30	30.239	30.095	30.1670		"	"	"				"	
20	48.0	35.7	41.85	30.034	30.010	30.0220	Few Nimb. W.	"	"	"				"	
21	47.0	34.0	40.50	30.052	30.009	30.0305	Cum. from 4 p.m.	"	Fine till 4 p.m. Overcast and Rain	Calm				Adams sound	
22	43.2	36.6	39.90	30.011	30.045	30.0295		Damp	Overcast	S.	32°			"	
23	38.0	33.8	35.90	30.049	30.097	30.0730		Rain & Fog	Rain & Fog	Var.				"	
24	38.8	33.5	36.15	30.082	30.047	30.0645		"	"	Calm				Admiralty inlet	
25	35.6	32.0	33.80	29.965	29.883	29.9240		Stormy	"	N. to E.				"	
26	35.9	34.0	34.95	29.828	29.800	29.8140		F & Wet	Partly O'cast	"				"	
27	37.2	34.1	35.65	29.749	29.801	29.7750	Cir-Cum.	Sunny and Windy	Sunny and Windy	"				"	
28	37.0	33.0	35.00	29.860	29.899	29.8795	Cum. p.m.	Thick Fog	Partly o'cast	N.E.	33°			"	S.E. wind in p.m., from 5. Pack opening in morning
29	47.2	33.1	40.15	29.975	30.510	30.2425		Fine	Fine till 4 p.m.	Calm	34°			"	Steamed off at 6 p.m.
30	40.2	37.7	38.95	30.065	30.090	30.0775		Rain	Rain & Fog	S.E.	36°			Lancaster s'd	Rain from 1 a.m. to 3 p.m.
31	44.9	34.0	39.45	30.149	30.130	30.1395		Fine	Fine	Calm	33°			Pond's inlet	Stopped by ice at 5 p.m. opposite Button Pt.
Sums	1357.8	1064.4	1211.10	928.164	928.530	928.3470									
Means	43.8	34.3	39.07	29.9408	29.9526	29.9467									

MONTH OF AUGUST, 1911

Day of M th	Fahrenheit		Barometer			Clouds	Gen'l State of Weather		Wind	Temp. Surface Sea-water	Ice- Thickness	Depth of Snow	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Range	Morning	Evening		Mean	Midnight to Noon						
1	36.0	32.9	34.45	30.088	30.030	30.0590	Wet and Foggy	Wet and Foggy	N.E. Calm	33°			Ponds inlet	From 5 p.m. Compact fog. At 10 p.m. fog all cleared. Cir-Cum. beautifully coloured by sun's rays. Overcast from 8 p.m.
2	34.1	32.0	33.05	30.049	30.051	30.0500	Very thick Fog	Horizon Foggy	"	32°			"	
3	43.0	33.9	38.45	30.047	30.020	30.0335	Fine, Clear	Fine, Clear	"	32°			"	
4	40.0	32.5	36.25	30.070	30.000	30.0350	Mist & Fog	and Sunny	"	32°			"	
5	47.2	33.0	40.10	29.950	29.948	29.9490	Par. O'cast	"	W.	32°			"	
6	54.0	38.0	46.00	29.949	29.948	29.9485	"	Rainy	"	32°			Albert hr.	7 to 8 p.m., beautiful rainbow. Few short showers in afternoon Occasional showers and fogs. Sun showing in interval.
7	46.9	39.2	43.05	29.900	29.875	29.8875	Fine	Fine	"	32°			"	Occasional fogs all p.m.
8	44.0	37.5	40.75	29.875	29.900	29.8875	"	Foggy	E.	32°			"	
9	43.3	39.0	41.15	29.935	29.915	29.9250	Foggy	Fine & Clear	"	32°			"	Aneroid barometer used when sailing viz., from July 29th to Sept. 24th, 1911.
10	44.7	37.6	41.15	29.990	30.000	29.9950	Fine Clear	"	Calm	35°			Salmon river	Zenith
11	45.0	37.2	41.10	30.080	30.050	30.0650	Foggy	Foggy	S.	35°			"	
12	42.5	34.3	38.40	30.120	30.130	30.1250	"	"	Calm	35°			"	
13	48.5	34.9	41.70	30.170	30.135	30.1525	Clear and	"	"	33°			Milne hr. sail- ing towards Lancaster sd	Rainbow seen on the 5th rising from the North and running to the West.
14	54.0	45.8	49.90	30.100	30.090	30.0950	"	"	N.E.°	33°			"	
15	46.8	42.0	44.40	30.150	30.140	30.1450	Low Shies	"	Calm	33°			"	
16	38.5	36.6	37.55	30.150	29.950	30.0500	Overcast	Misty	"	33°			Prince Regent	Short showers in p.m. Stopped by ice. Turned back 10 p.m. Foggy from 10 p.m.
17	38.0	35.2	36.60	29.950	29.850	29.9000	Rain & Fog	Partly	S.	33°			"	
18	40.8	36.5	38.65	29.940	30.010	29.9750	Overcast	Overcast	S.W.	32°			Lancaster	
19	47.0	35.0	41.00	30.060	30.155	30.1075	Foggy	Very Fine	S. to W.	32°			Navy Board	6-12 p.m. Fog. Fell in field-ice and heavy fog at 10 p.m. New ice 3/4" thick formed during night.
20	48.2	44.8	46.50	30.202	30.204	30.2030	Fine	Fine till 6 p.m.	Calm	32°			Eclipse	Lat. 72° 02' 12" N. New ice 1/4". Stopped by ice, going East for opening. Temp. of water low on account of large quanti- ties of ice on the sea.
21	36.9	32.0	34.45	30.140	30.050	30.0950	Thick Fog	Occas. Fogs	"	32°			Baffin bay	
22	42.4	29.0	35.70	30.003	29.970	29.9865	Foggy	"	N.E.	32°			"	
23	39.0	32.0	35.50	29.980	29.940	29.9600	"	Fine from 2	W.	32°			"	
24	38.2	34.3	36.25	29.915	29.885	29.9000	Par. Foggy	Sunny, Clear	"	32°			Davis Strait	Passed Home Bay. Stopped by ice at 3 p.m.
25	43.9	32.0	37.95	29.900	29.948	29.9240	"	"	S.-S.E.	30°			going South	Lat. 67° 54' 07" N. 10 to 12 p.m. Drizzling rain. Navigation through pressed old ice, stopped but drifting South.
26	39.0	31.5	35.25	29.950	29.920	29.9350	Clear-Fine	"	"	29°			along Coast	New ice of preceding night 2 1/4" thick.
27	36.7	28.9	32.80	29.810	29.740	29.7750	Cloudy	Overcast	N.	30°			of Baffin is.	10 p.m. Faint A.B. in the South. Lat. 67° 14' 20" N. 2.07 a.m. snow blizzards.
28	36.0	31.5	33.75	29.740	29.740	29.7400	F gy, D'imp	"	Calm	34°			"	
29	34.0	28.6	31.30	29.650	29.685	29.6675	Snow-Fog	Fine	"				Cumberland G	Lat. 65° 30' 30" N. Clear water. Meeting large icebergs.
30	38.1	30.1	34.10	29.556	29.600	29.6080	Hazy	Very Foggy	"	34°			"	
31	40.0	33.8	36.90	29.720	29.725	29.7225	Foggy till 4	Fine but Cloudy	W.	34°			"	Rain from 6.45 p.m. to 11. Temperature rose to 41°.
Sums	1306.7	1081.6	1194.15	929.139	928.664	928.9015								
Means	42.15	34.89	38.52	29.9722	29.9569	29.9646								



MONTH OF SEPTEMBER, 1911

Day of Month	Fahrenheit		Barometer		Clouds	Gen'l State of Weather		Wind	Temp. Surface Sea-water	Ice Thickness	Depth of Snow	Locality	GENERAL REMARKS
	Maxi- mum	Mini- mum	Range	Morning	Evening	Mean	Midnight to Noon	Noon to Midnight					
1	41.5	39.2	40.35	29.637	29.550	29.5935	Rainy	Fine & Windy	S.S.W.-			Cumberland G	Drizzling rain in a.m. Heavy wind all p.m.
2	40.7	38.8	39.75	29.510	29.520	29.5150	Rain and Wind	Overcast	N.E.	40°		Blacklead Is.	Lat. N. 64° 57' 21".
3	43.0	38.7	40.85	29.649	29.758	29.7035	Fine	Very Fine	S. to E.			Greenland Sea	Lat. N. 63° 34' 26".
4	40.5	35.5	38.00	29.805	29.825	29.8150	Fine and Clear	"	E.	35°		"	
5	35.0	32.0	33.50	29.890	29.900	29.8950	Fine	Cloudy	"			Hudson St.	Lat. N. 62° 29' 00".
6	40.2	35.0	37.60	29.590	29.270	29.4300	Overcast	Fine	"	34°		"	5 to 7½ a.m., snow blizzard. 8.45 to 11 a.m., rain.
7	40.7	34.1	37.40	29.250	29.080	29.1650	Fine	Wet & Windy	N.W.	33°		Port Burwell	or Killinek, North Labrador, where 32" of rain fell in August
8	41.6	35.5	38.55	29.560	29.650	29.6050	Wet and Windy	Wet & Foggy	"	32°		"	Intermittent rains, fogs and snow-furries in p.m.
9	36.8	36.0	36.40	29.715	29.560	29.6375	Wet and Foggy	Rainy	"			"	Lat. N. 60° 30' 01". Fog and drizzling rain.
10	42.0	35.2	38.60	29.440	29.055	29.2475	Rainy	"	Calm	33°		"	Fog and drizzling rain.
11	42.1	32.8	37.45	29.300	29.350	29.3250	Very Windy	and Fine	S.	34°		"	Fog and rain pouring in afternoon.
12	40.0	36.0	38.00	29.610	29.570	29.5900	Fine & do	Overcast	W.	33°		"	10 p.m. very brilliant A.B. of a pale yellow.
13	35.5	33.0	34.25	29.205	29.550	29.3775	Stormy & Overcast	Windy	S.E.	33°		"	Rain stopped during night, wind turning to West.
14	37.6	33.9	35.75	29.700	29.965	29.8325	4 p.m. Cum.-Str.	Clear and Bright	E. to N.			Labrador	
15	42.0	35.0	38.50	30.065	30.200	30.1325	Clear and Windy	Clear and do till 10	"	33°		Coast	At 3 p.m. Therm. rose to 36. Heavy gale with snow, rain and sleet till 2 p.m.
16	45.0	43.6	44.30	30.265	30.210	30.2375	do	Low Skies	S.W.	35°		"	Lat. N. 56° 51' 19". 5 a.m. snow furries. 8 p.m. A.B. N.W.
17	47.2	41.1	44.15	30.150	30.340	30.2450	Rainy and Very Fine	Very Fine	"	36°		"	Lat. N. 54° 47' 57". 8 p.m. Fine display
18	54.2	44.7	49.45	30.400	30.450	30.4700	do	Clear and Fine	S.	39.7°		"	A.B. Lat. N. 53° 37' 00". 10 to 12 p.m. Rain.
19	50.0	48.2	49.10	30.290	29.960	30.1250	Morning Overcast	Clear till 5	S.&N.E.	42°		"	Lat. N. 53° 02' 00". 12 to 5 a.m. rain. Black thick clouds all p.m.
20	49.4	44.0	46.70	29.800	29.940	29.8700	Rainy, Foggy	Interval Fogs	E. & N.	43°		Belle-Isle	From 6 p.m. wind variable.
21	52.6	41.3	46.95	30.095	30.240	30.1675	Clear and Fine	Clear and Fine	E.	44°		St. Lawrence G	Foggy from 5 p.m. 8.35 to 10 a.m. rain.
22	52.0	44.6	48.30	30.200	30.235	30.2275	Fine	"	W.	44°		Anticosti	Rained all night. Clear 11 a.m. to 2 p.m. Fogs from 2 to 5 p.m.
23	56.8	43.0	49.90	30.310	30.165	30.2375	Rainy	"	S.W.			St. Lawrence	Rained from midnight till 10 a.m.
24	63.9	51.6	57.75	29.970	30.060	30.0150	Fine till 7	"	E.			"	Passed Isle Verte.
Sums	1070.3	932.8	1001.55	715.516	715.403	715.4595	Fine, Wdy	"	S.W.			Arrived Quebec	11 p.m.
Means	44.6	38.87	41.73	29.8131	29.8065	29.8108							

J. T. E. LAVOIE, C. E.

Scientific officer on board the C.G.S. "Arctic," 1910-1911



Mr. Chassé, Hunting Expedition, Spring, 1911.

APPENDIX NO. 5.

REPORT OF O. J. MORIN, FIRST OFFICER OF THE "ARCTIC," ON A TRIP FROM THE SHIP IN ARCTIC BAY TO THE SOUTHERN END OF ADMIRALTY INLET, IN OCTOBER, 1910.

Translated from the French.

In compliance with instructions, I hastened the preparations for this voyage, and on the 10th of October at 9.30 a.m. I left the winter quarters with the eskimo guide Mack-Ka-Ta-Wii, travelling on a sleigh, and part of the provisions I was to use while travelling, the balance to be given to Mr. Lavoie when parting from him to trace back my steps.

Mr. Lavoie, chief of the expedition, had with him two sleighs and the eskimo guides Mack-Kie-Shasse and Koo-Noo, the latter accompanied by his young son. These Eskimos were driving the sleighs, each one of which was drawn by ten dogs. The provisions Mr. Lavoie had taken with him were to last forty days.

Below is a summary taken from my diary from the time I left the ship on the 10th of October last until my return on the 31st of the same month.

October 10th, 1910.—Lavoie's expedition which I joined left the ship this morning at 9.30. The commander and several members of the crew came with us as far as Nasso village, on the south west shore of Arctic bay, near Adams sound. There we were greeted by the whole population of the village, which had come out from their igloos to welcome us and wish our party all sorts of success in our travel.

At 10 o'clock the three sleighs started in the direction of the southwestern entrance of Adams sound, going crossways over the sound. The weather was fine and the ice of the sound was hardly four inches thick. The commander and petty officer Joseph Lessard accompanied us for three miles. Along the way the petty officer killed a seal on which we immediately fed our dogs.

Mr. Lavoie's sleighs were leading the way with the guides Koo-Noo and Mack-Kie-Shasse, my sleigh being the last one.

Towards 2 o'clock in the afternoon as we were travelling along the shore, some 50 feet off the land, the ice broke under Mr. Lavoie's sleigh, which sank in twelve to fifteen feet of water carrying down Mr. Lavoie, Mathé, and the guide Mack-Kie-Shasse, who tried to keep the sleigh on the ice. However, we managed to recover the sleigh, and established camp to spend the night and dry our clothes. We were some 10 to 11 miles away from Arctic bay, the shore was rough, and we experienced some difficulties in finding a spot on which to pitch our tent.

October 11th, 1910.—2 p.m.—We spent a comfortable night under the tent. Mr. Lavoie having decided to return to the ship with one of the sleighs, we put on it the wet garments that we could not dry in the tent, and with thirty dogs we returned to the ship.

October 12th, 1910.—At 9 a.m. we left the ship forming a party composed of Mr. Lavoie, Mr. Mathé, the Eskimo guides and myself with the intention to proceed with our journey, interrupted by the above accident. At 11 a.m. we started



About 67 miles from Cape Cunningham, Admiralty Inlet, October, 1910.

in the direction of Admiralty inlet driving our three sleighs. The ice was hardly strong enough to bear the weight of our three heavily loaded vehicles. Finally at 1.15 we rounded cape Cunningham at the south of Adams sound entrance of Admiralty inlet. There we found the ice somewhat thicker. About three in the afternoon we found ourselves opposite two small islands situated four miles to the south of cape Cunningham and over 100 yards from the shore. At sunset, that is to say, about 4 p.m., realizing that the ice was not strong, we pitched our tents on the shore to spend the night. The weather was pleasant, but rather too mild.

October 13th, 1910.—We started at 8 o'clock, and half an hour later were travelling due south following the shore, finding the ice to be stronger than yesterday. At 11 a.m. we could see four small rocky islands, the largest of which is called Richards island on the chart. This island is five to six miles from the shore. It seems to be round and about 50 to 60 feet high. The three upper islands are smaller, situated to the east of Richards island and only a couple of miles from the shore. The highest one of these small islands may be 30 feet high. They were situated

in the direction northeast and southwest of the larger island which lies in the middle of the group. Richards island lies some 19 to 20 miles S. S.W. of cape Cunningham. At 12.45 noon time we rounded a little point running along a small river. Here the land of the shore rises from 300 to 400 feet. It is of reddish hue. As for the mouth of the river it may be from 90 to 100 yards wide. The guide Koo-Noo told me that the water of this river rises a great deal in the spring, and that salmon are plentiful in August. From the entrance of Adams sound to the river just mentioned the shore is situated almost exactly in the direction S. to N., although at the river it makes somewhat of a bend to S.E. At 2 p.m. we crossed a pretty bay lying towards the east, and at 3 o'clock we could see a low point stretching out into the sea towards the S.W. On the S.E. side of the point the shore changes its direction to S. by E. $\frac{1}{2}$ E. Here the shore is rather uneven and completely barren. From our departure the wind was almost constantly from the N.W. This day we travelled 7 miles before pitching our tent and without seeing anything on Levasseur inlet.

Oct. 14th, 1910.—5 p.m.—Having left this morning at 8.15 we stopped only at 4 p.m. to camp, having travelled 22 miles. The weather was fine. At 10 a.m. our sleighs rounded the northern point of the entrance to Moffet bay, which is in fact an inlet extending 35 miles inland in the direction S.E. by E. to N.W. by W. The entrance to this bay is 70 miles wide, and in the middle of it we passed near a large grounded iceberg, towering more than 80 feet above our heads. At 3 p.m. we rounded the southern point at the entrance of Moffet bay or inlet. Then we proceeded towards the extremity of Admiralty inlet, where more old ice was found. Apparently this stretch of water is never completely free of ice, as we find that the ice of former years is yet very thick.

October 15th, 1910.—Saturday, 6 p.m.—We left this morning at half past eight and travelled due south. From Moffet inlet to Dominical island the coast forms a large bay, 4 or 5 miles long, stretching towards the east. Here the coast is low, but it seems to rise gradually farther inland towards the S.E. In the bay itself I noticed several reefs. At 10 a.m. we rounded the point S.W. of two large islands, ten to twelve miles long each one. They are divided by channels about 2 miles wide at the N.E. end of which lies a small rocky island. The two islands just spoken of are about 80 feet high. From the S.W. end of these islands we could see mount Kir-Kei-Too N.W. by W. from us and S.S.W. were six small islands and reefs against which the pressure of the ice makes itself felt very strongly. At about 11.30 a.m. we reached the ice pack which was bearing strongly upon old ice. Here the greatest difficulty of our voyage since we travelled on the ice of Admiralty inlet was experienced.

At 3 o'clock we had negotiated these first ice ridges and were on the north side of an island and confronted by a long reef stretching from the north point of Dominical island towards the N.W. The ice was bearing strongly against the ridge. As for the island it may be four or five miles along the shore which is almost circular. Its height is about 200 to 250 feet above the water level. I called it Dominical island because we intended to spend on it the next day which was Sunday. At 4 o'clock we raised our tent with the intention of remaining on this spot until Monday.

To-day we travelled 17 miles, the coast is rather dangerous in this neighbourhood for any ship that would hug it, on account of numerous small islands and reefs. On land we saw a flock of ptarmigan, and our eskimo has killed a seal not far from landing. Near our camp were four old eskimo huts built with stones like those that can be seen on the shore of Arctic Bay.

October 16, 1910.—Sunday 6 p.m.—We spent this day on Dominical island as it had been decided. Our eskimo killed 5 seals on which our dogs were fed for a few days. Mr. Mathé, having done some prospecting on the island, has noticed a few veins of quartz. This would seem to indicate the presence on Dominical island of some precious metal. At noon Mr. Lavoie and myself have tried to make

some solar observations to find the exact latitude of the island, but we were unfortunately prevented by fog. S.E. from Dominical island Admiralty inlet makes a large indentation on the coast of Baffin island. The bay thus formed is from two to three miles long and one mile wide. We noticed in it several fields of old ice attached to the new ice of this year. Generally speaking, the shore of the bay is low. There is a beach all around the bay, and from it the land rises gently towards the interior.

October 17th, 1910.—Monday 6 p.m.—The weather was fine. We left Dominical island at 8.30 this morning, and travelled some 25 miles before reaching the camp where we spent the night. A little to the S. of S. end of Dominical island the coast of Baffin island bends towards E.S.E. Then several miles farther it turns back to the south. We have travelled from one end to the other of this curve, this part of the journey lasting a couple of hours. On account of pressure the ice was rather rough and we had some difficulty in driving our sleighs over it. Near the south point of this bay Mr. Mathé discovered a vein of mica running over a distance of nearly two miles, but we had no time to stop over to do more prospecting. All along, the shore has been subjected to great pressure. From our camp we could see mount Ikerloo to the S.W.

October 18th, 1910.—Tuesday 6 p.m.—To-day we only travelled some 11 miles from 8 in the morning until 12.30. Our dogs seemed tired, so we had to stop for the balance of the day. One of our guides having killed a deer, we had a meal of venison. While travelling we saw several tracks of deer which apparently were migrating in great numbers towards the south of Baffin island. We established our tent on a low sandy point.

October 19th, 1910.—Wednesday 6 p.m.—We started this morning at 8.35 leaving the land behind us and travelling due south towards the group of Shinik islands. Several times we crossed fields of new ice. While travelling we passed between the midland and the two small rocky islands near which the C. G. S. "Arctic" stopped during her cruise last fall. To-day our sleighs covered twenty-two miles in the direction of Shinik.

October 20th, 1910.—Thursday 6 p.m.—This morning at 11 o'clock we reached the Shinik islands. Mr. Lavoie proceeded towards Agoo. The Shinik islands are four or five in number. They are pretty large, and at a distance appear as a single island. The water is very shallow along the coast. It is possible to walk from one island to the other at low tide. Tide currents are very swift between the islands. They are situated at the farthest extremity of Admiralty inlet, and, generally speaking, they follow the direction N.W. to S.E. from the mainland. These islands are some four to five miles to the S.W. of the mainland, and from seven to eight miles to the S.E. of the coast. They are rocky and very low, being hardly 50 feet above the sea level.

A large river empties itself at the inland extremity of Admiralty inlet. Salmon are plentiful in this river, which is fed from large lakes, where, according to the eskimos, large salmon are to be found as well as fresh water seals.

As I have just said, we reached Sassiloet at 11 p.m. and there established our camp. This afternoon we built a small cairn on this spot. The cairn made out of rocks is about three feet high and five feet wide at its base. In it we have left a record, as well as the carved piece of board given by the captain to be left in the camp. On one side of the board is to be found the name of the C. G. S. "Arctic," and on the other the name of Commander J. A. Bernier. The weather having been very foggy all through the day I have been unable to take any photos of Shinik islands.

October 21st, 1910.—Friday 6 p.m.—Messrs. Lavoie and Mathé left this morning, proceeding towards the mainland in the direction of Agoo. At the same time I left camp myself and started my voyage to return to Arctic bay. While passing through Shinik bay I took some soundings. To the east of the islands I found the depth of water to be 5.7 and 11 fathoms in the direction of the east

coast of Admiralty inlet. This part of the coast is very abrupt, and the land, which is rocky, rises from, say, 700 to 800 feet above the sea level. I am obliged to hasten my journey, having nothing left to feed my dogs, and as Mack-Ka-Ta-Wii has lost his spear it is impossible for us to kill any seal to feed the dogs.

October 22nd, 1910.—Saturday 6 p.m.—We left camp this morning at 8 and proceeded in the direction of N.E. over baie Platte. This bay is very shallow. I took a few soundings and found the depth of water to be 14 fathoms near the channel of Admiralty inlet, and from 10 to 6 fathoms when going towards the extremity of the bay. In the N.W. part of this bay there is a reef situated N.W. to S.E. I noticed several growlers stranded in from 4 to 5 fathoms of water. From this bay I intend to reach Moffet inlet. To-day we travelled about 18 miles.

October 23rd, 1910.—Sunday.—There was no sun to-day, the sky remaining cloudy all through the day. We left our camp of baie Platte at 9 a.m. and proceeded along the valley which is to be found N. by E. of baie Platte. Its vegetation is abundant, and we had to pass through wild hay, mosses and aquatic plants which in height reached our knees. I have also seen several clusters of bushes from two to three feet high.

In the valley are to be found several small lakes over which we travelled when possible owing to the difficulty of moving our sleighs on land. At noon we killed a large deer and we saw several of these animals for which the pasture of the surroundings seem to be very good. During the day we covered from 6 to 7 miles.

October 24th, 1910.—Monday 6 p.m.—We are travelling over a low plain all covered with snow, no sun is to be seen. The weather is very dreary. Even the dogs do not seem to enjoy this part of the journey. Their exhaustion over this land is noticeable. Our sleighs with their iron runners are unfit to travel over these prairies of mosses. The tracks of animals seen lead me to believe that deer, foxes, hares, wolves, also ptarmigan, etc., are plentiful in this neighbourhood.

October 25th, 1910.—To-day we travelled six miles in a straight line, and probably twice as much owing to the circuitous course we had to follow. Fortunately we have left the plain behind us, and have reached the S.E. extremity of Moffet inlet. On reaching Moffet bay the plain makes a curve towards the east of some three miles. The basin constitutes the extremity of Moffet inlet, is four miles wide and six miles long, and of an elliptic shape. Towards the S.E. one can see the summit of a solitary mountain which is shaped like a sugar loaf. On the edge of the said basin the ice has been pressed against the south shore and on the S.E. shore of the basin I have seen a very large stranded iceberg. The basin I am speaking of is full of very old ice. We camped on the shore of the bay.

October 26th, 1910.—Wednesday 6 p.m.—Sky cloudy. Snow has just commenced to fall. We have crossed the basin from one end to the other. We camped for the night on the south point of this bay. To-day we have travelled about six miles. The banks along the basin are 500 feet high and the north shore is somewhat higher than the southern. As for the water of the basin it is shallow, judging from an iceberg which I have seen stranded near the south shore. Along the shore of this basin was one of the several eskimo villages of which I have seen the shattered remnants. On the spot of my camp I have left in a cache from 600 to 700 pounds of deer meat and some 20 pounds of pemmican. It has been agreed with Mr. Lavoie that when returning he will take provisions from this cache.

October 27th, 1910.—Thursday 6 p.m.—We have travelled all day towards the mouth of Moffet inlet. The north coast of the inlet from the basin towards the west rises from 800 to 1,000 feet and it is pretty steep right from the sea shore. The south coast is lower on both sides where a few bays, which I have no time to visit, are to be found, but according to the general appearance of the country the water must be pretty deep.

October 28th, 1910.—Friday 6 p.m.—The day has been rather foggy. I wished to take a few photographs of the coast of this beautiful Moffet inlet but the lack of good light prevented me from doing so.

Moffet inlet must be from 35 to 37 miles long from its mouth to its farthest extremity inland. As for its width, I should judge it is above 12 miles along the first half, then four to five miles farther in up to the basin. The Eskimos said that salmon are to be found at the extremity of this inlet. The distance we covered is about 20 miles, while yesterday it was only about 17 miles.

Thursday, October 28th, 1910.—On this day two parties comprising O. J. Morin, first officer, with Mack-Ka-Ta-Wii, and J. E. Lavoie, C.E., with Mathé and two Eskimos, having left the ship "Arctic," wintering in Arctic Bay, Adams sound, have here built a cairn, and left record inclosed; Mr. O. J. Morin having surveyed the south end of Admiralty inlet is leaving to-morrow to return to the ship, whilst Mr. Lavoie continues to Agoo in order to survey the coast of Prince Regent inlet from cape Hallowell to cape Kater.

From observations taken to-day, latitude found is $71^{\circ} 03' 33''$.

C. G. S. "Arctic" is at the present time commanded by Capt. J. E. Bernier.

October 29th, 1910.—6 p.m.—To-day we travelled about 15 miles. The wind has been blowing almost constantly from the N.W. No sun was to be seen, and the sky remained cloudy. This evening our dogs are very tired, and my good guide Mack-Ka-Ta-Wii is ill. It is nearly time for us to reach the ship. While travelling we have seen many tracks of deer.

October 30th, 1910.—Sunday.—Our camp is on one of the two small isles situated 4 miles to the S.E. of cape Cunningham, and 5 miles from the point of the S.W. entrance to Adams sound. I wanted to reach the ship this very evening but the dogs are too tired to proceed any farther. To-day we travelled about 20 miles.

October 31st, 1910.—Monday.—At 12.30 we arrived at the ship after 4 hours of journey, and having covered 16 miles. May I be allowed here to praise the sterling qualities of my excellent guide Mack-Ka-Ta-Wii. He is the best type of a faithful and kind guide.

I was greatly pleased to have an opportunity of exploring the eastern coast of Admiralty inlet from Adams sound to the Shinik islands, although the weather was not quite favorable for an expedition. I have been able, however, to form a fairly good judgment concerning the geographical details of this part of the country, of its coasts and the islands in its vicinity. I am sorry that the atmospheric conditions I have met with prevented me from taking as many photographs as I desired to bring back.

If I am not mistaken, I have been the first white man who ever laid foot on the coast and the above mentioned islands.

I am, Sir,

Your obedient servant,

O. J. MORIN,

Chief Officer.

APPENDIX NO. 6.

SUMMARY OF THE REPORT OF MR. ROBERT JANES, SECOND OFFICER OF THE CANADIAN GOVERNMENT STEAMER "ARCTIC."

Mr. Janes begins his report of his first trip from Arctic bay by quoting a document which he left in a cairn at the eastern end of Adams inlet in October, 1910. The certificate is as follows:—

"This is to certify, that on the 12th day of September, 1910, the C. G. S. 'Arctic,' commanded by Capt. J. E. Bernier, arrived at Arctic bay, Adams inlet, Baffin island, having been as far west as Melville island, the ship having crossed McClure strait, or within 25 miles of Prince of Wales strait, in the attempt to make the northwest passage. Having gone thus far it was found impossible to get farther, owing to the impenetrable barrier of old arctic ice that stretched east and

west as far as the eye could see. The ship then steamed west for about fifty miles to ascertain if it would be possible to get around the floe. Here again ice conditions were found to be the same, so that the ship had to retreat, and after a hard fight of ten days, contending with heavy ice the whole way, she arrived at the before-mentioned bay as stated.*** "

I was ordered by the commander to fit out an expedition to try and get to the eastern end of Adams inlet, to ascertain, if possible, if game could be found in the vicinity of the eastern end of Adams inlet, and to prospect for minerals.

The party for this expedition consisted of myself, two of the crew and one prospector. We left the ship at 10 a.m., and rowed up the inlet about 14 miles, where we camped. It was impossible to proceed further, owing to so much newly made ice. Here the party hunted for some time, until the ice was strong enough to carry the boat, when the party returned to the ship. Deer were plentiful in the locality, and the weather was fine.

After remaining two days, the party started again for the eastern end of Adams inlet, this time taking with them dogs and sleighs, and arrived at the point which they set out to reach, about 25 miles from Arctic bay. There were many signs of deer, foxes and rabbits, and the prospector in the party reported the finding of different kinds of economic minerals in the locality.

A big ravine was travelled for a distance of 10 miles. This ravine ran southwest and westward. The country about was mountainous, and broken here and there by large valleys.

It appears from the report of Mr. Janes that in the document left in the cairn he gave directions to find the way to Ponds inlet and intimated that the Government steamer "Arctic" was making Arctic bay her headquarters for the winter of 1910.

Mr. Janes returned to the ship for another supply of provisions, this time taking sufficient to last the party 16 days. Twelve dogs were taken, as they could travel on the ice in Adams inlet. After two days travelling the extreme end of the inlet was reached and a tent set up. In the party was an eskimo who had been taken as a guide.

The inlet is described as being about four miles at its greatest width, and about one mile from the end it narrows. The water is deep in the inlet until within two miles of the extreme eastern end, where it shallows to about two fathoms. The land on both sides of the inlet near the eastern end is steep. Perpendicular cliffs run along the north side three parts of the way up, and the remainder is a high mountainous country with long sloping slides to the water's edge. The western end of the inlet is described as lower than the eastern end, but mountain slopes are not infrequent. The ravine already referred to may be travelled for some distance, but as it presents difficulties at its end, a view may be obtained of the surrounding country away to the northeast, and this view presents a broken mountainous country, apparently impassable.

The country looking southeast and southwest around to westward is more even but showing some very high peaks here and there. The country is rocky with scarcely any vegetation, and at the time of his second trip the face of it was covered with snow.

The general opinion formed by some prospecting is that copper pyrites, iron ore and mica can be found at different points. There is proof of this in the specimens obtained on this trip. The mica found was in small sheets.

The snow, however, prevented a careful examination of the rocky sides of the inlet for minerals.

The inlet had been travelled on both sides carefully, with the exception of about 10 miles on the south side of it.

A report was made by Mr. Janes of a trip to Ponds inlet during the month of December, 1910. On this trip three komatiks or sleighs and 30 dogs were taken, and the party consisted of Mr. Janes and three eskimos with about 500 pounds weight to each sleigh.

Between Arctic bay and Strathcona sound is Victor bay, and between the three sheets of water there are two necks of land.

Rapid progress was impossible as the snow was six inches deep and not sufficiently hard to carry the weight of the sleighs and their loads.

The weather, however, was favorable, but growing colder. The party travelled along the shores of the different bays and inlets, one of them being Baillarge inlet. The ice had pressed upon the land and was difficult to pass over. The dogs, however, were in good condition. When the roughest part of the ice had been passed over, there was some good travelling and progress was made without difficulty, until Elwin inlet was reached where the ice was too thin to carry the loads. The going was good after Elwin inlet was passed, until the ice on the shore where pressure had occurred made it difficult to pass over and keep the sleighs from upsetting.

The rafted ice was even more difficult on account of the snow that had drifted in the hollows of the ice.

The weather had been fine up to the 15th of December, when a high wind set in and caused the snow to drift, making it impossible to see at a greater distance than five yards away. A place was selected under a small cliff to build an igloo in which to rest and sleep. The weather on the 16th had cleared and fairly good travelling was found.

Navy Board inlet was reached and another igloo was built in order to take some rest and give the dogs a rest also, as they had become tired. The 17th of December was fairly good weather for proceeding and the party pushed on, but the cold was becoming intense and the wind blew half a gale out of Navy Board inlet.

An incident occurred at this time which was not at all pleasant; the dogs became very hungry and had eaten four sets of harness, causing a delay for a whole day. After this unpleasant stop, a change was made by caching some of the provisions before starting afresh.

The ice in the centre of the passage now taken was very good, but on both sides very heavy, owing to the great pressure of ice, which had turned up in all shapes.

The party turned Canada point on the 19th of December at noon, where a stop was made and an igloo built in order to rest the dogs that had become exhausted. The last of the seal meat that had been taken from the ship was fed to them.

The cold at this time was intense; notwithstanding that the party had walked and run their feet became numb. This day, however, was the coldest of the whole trip, and the whole party, together with the dogs, were very much fatigued, having lost sleep and having suffered from intense cold.

On the 20th, a fresh start was made in frosty weather and with hungry dogs. The party found an igloo on turning into Eclipse sound. A fresh start was made on the 21st, and the party progressed for some distance to a point where another igloo had been built by eskimos.

The course was now taken directly across Eclipse sound towards Salmon river; the going, however, was very slow, owing to the fact that much snow had lodged on the ice, but there was little wind and the party plodded along all day and all night until Salmon river was reached on the 22nd.

The whole number of the party were tired, hungry and cold, and to make the conditions more unpleasant, not a soul was to be seen in the place, as the natives had left it. No time was lost here, and the party started again with the intention of reaching Ponds inlet station, at which place they arrived all well, and were revived by the food that was given them at the station.

Here an igloo was built of snow; it took three days before it was considered fit to occupy, but after it was built it was fairly comfortable.

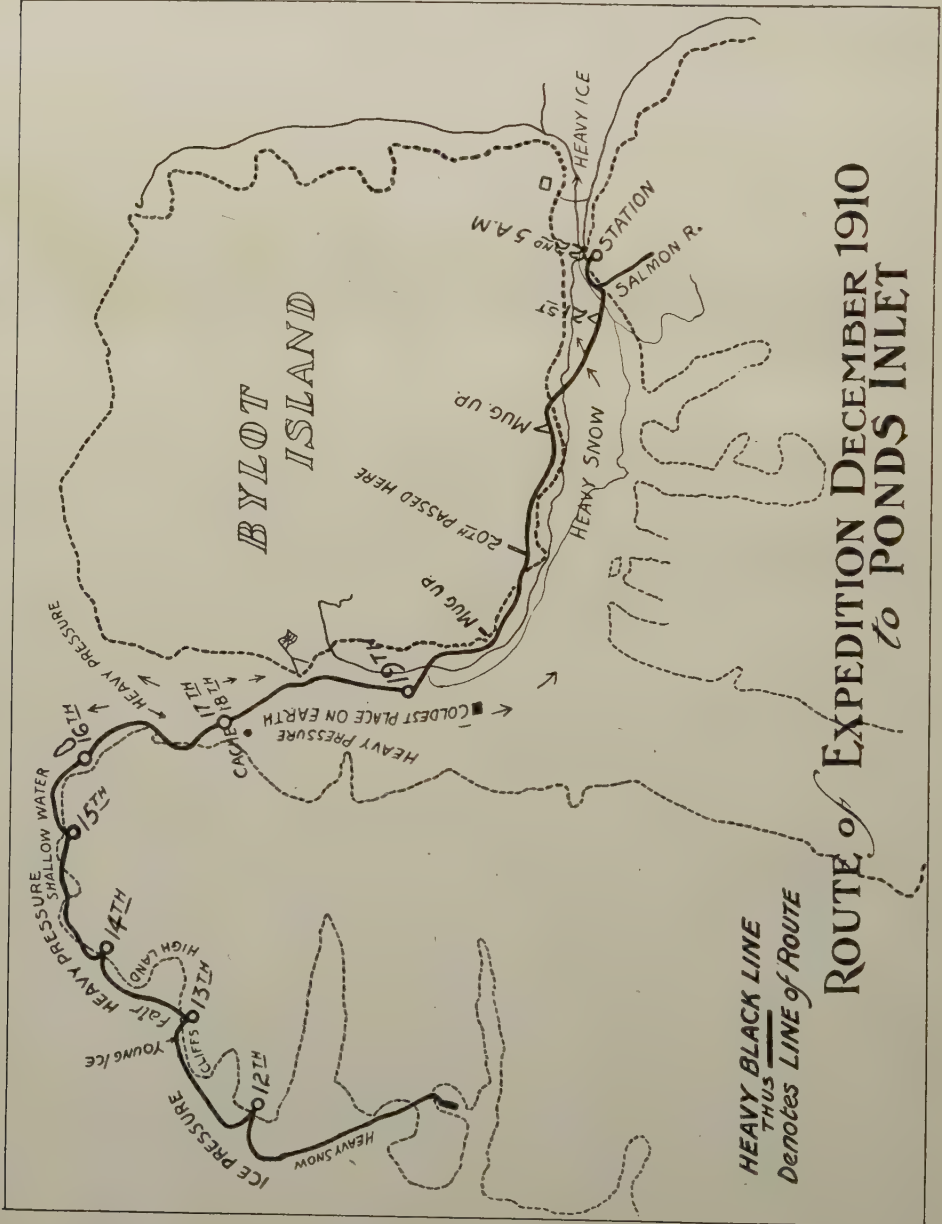
The leader of the party states that for the whole distance from Arctic bay to the station at Ponds inlet he had not driven more than 10 miles on the sleigh.

It was more agreeable walking and running than sitting on the sleigh in the extreme cold.

On arrival at the station it was noticed that the ice had piled up to a considerable height on the reef in that part of Ponds inlet.

The eskimos who accompanied Mr. Janes were described by him as smart, able and willing. Muckwawee was superior to Monkey-shaw, but the third eskimo became crippled on the second day out from the ship and had to be drawn all the way from Arctic bay to Ponds inlet station. The accident occurred to him by the sleigh sliding on his foot, and he suffered intense pain from the cold.

During the trip five hundred cartridges were lost from one of the sleighs, but the loss was not discovered until 25 miles of distance had been covered.



On arrival at Ponds inlet, Mr. Janes found the natives in a starving condition. It appears that from the middle of December, seals had been so scarce that the natives had hardly been able to keep body and soul together. Notwithstanding the starving condition of the natives they had not taken any food from the government cache, which is certainly a striking proof of the honesty of these poor people.

They were supplied from the government cache until the period arrived when they moved to Button point.

In connection with this expedition under control of Mr. Janes, instructions had been issued to him to gather information from the natives respecting halibut, and, if possible, to visit certain points eastward of Button point, Bylot island, to try for halibut himself. This station was left on the 1st of April, 1911. Accompanied by the two natives, the party was conveyed by twelve dogs and the sleighs laden with provisions for ten days.



Eskimo Caravan, April, 1911.

The course was taken in the direction of cape Weld, and five miles from this cape open water was found, and the party proceeded to the edge of the ice floe and camped for the night. The fishing began on the following morning, but after paying out two hundred fathoms of line, it was found that there was no bottom at that depth; it was considered useless to fish in water so deep as it was, without doubt, entirely too deep for halibut fishing. The habits of the fish were well known to Mr. Janes, and he came to the conclusion that no halibut would be found there. Besides, the weather was so disagreeable that it did not appear reasonable to continue the experiment under the circumstances.

In the open water, which was from one hundred yards to one mile in width, seals, narwhales, white whales, and birds were seen.

The edge of the water was followed for thirty miles and at intervals the fishing lines were let down to ascertain if halibut were moving. At one place it was found that the lines touched bottom, and they were allowed to remain for a couple of hours, and at the end of this time, a fine large halibut, about two feet in length and very fat, was secured. A part of the fish was cooked and found to be very palatable.

Other attempts were made to catch halibut, but the tide carried the line instead of allowing the hook to rest on the bottom. The fishing experiment was carried on about twenty-five miles off shore. On returning to shore several trials were made through blow holes, but the water was so deep that it appeared useless to continue fishing. During the month of March, two small halibut were bought from the natives. These fish, however, were picked from the ice, having been brought to the surface by seals. This was determined by the fact that the heads had been taken off.

Mr. Janes arrived at the conclusion from what he had himself observed and from information from the natives, that halibut are plentiful at times on the coast of Bylot island in shallow water.

From information obtained from the natives, small fish are plentiful on the east coast of Bylot island, north of Button point, and, from the description by the natives, appeared to be either mackerel or herring.

A trip was made to Possession bay and coast, 65 miles from the west point of Bylot island. Instructions were given by Captain Bernier to proceed to Button point and watch for whalers.

On May 26th, Mr. Janes left the station to go to Salmon river. It was not the first trip to the river, but on previous occasions the snow was too deep to do effective work in the way of prospecting for coal. It was impossible to travel on the ice, owing to the great depth of snow, even on the trip now being described; consequently, travelling was done on the land where there was less snow than on the river. The intention was to go to the lakes from which the river flowed.

The first lake was reached on the 27th, and some prospecting was done about it. The ground, however, was frozen too hard to make use of picks or shovels. The journey was continued to what is termed the inside lake where the party camped. In addition to prospecting for coal, the object for which the trip was taken to Salmon river, there was an effort made to ascertain if salmon were running to the lake. A hole was cut in the ice, which at the time was very thick, measuring about six feet six inches. No salmon were taken.

The lake was measured, and found to be about seven miles long and one mile wide, surrounded on the S.E. side by very high country, which was a regular water shed. On the west is a low neck of land, which divides the inner from the outer lake. The compass bearing of this lake is N.W. and S.E.

Prospecting was begun on the 30th of May without success. It was observed during the search for coal that rabbits were plentiful about the lake.

From this inner lake, the trip was made again to the outer lake. The depth of this lake, however, was not ascertained, but it appeared to be shallower than the inner lake; the land around its shore is very low.

On the 1st of June, whilst passing along by the side of the river and on turning a sharp point of land, it was noticed that the banks were of a different formation from any others that had been seen, and a small piece of coal was picked up, and by use of a pick, part of the bank was exposed on the east of the river. A coal seam was here found, and a trial was also made on the west side of the river, where coal appeared to be in abundance. A bag of coal was taken from the locality for testing purposes. When travelling along, coal was picked up occasionally. Along a distance of five miles to the S.W. of this course coal was also found.

On the 4th of June, on the east side of the river, considerable quantities of what was called by Mr. English iron pyrites, was plentiful towards the mouth of the river. It is stated that coal can be seen fully exposed for about three miles on the west side of the river about four miles distant from the river mouth. The samples of coal that had been secured were afterwards tested at the station in a small cooking stove, and found to be excellent fuel for cooking purposes.

A trip was made in the early part of June. The locality, as already stated, was near Canada point on Bylot island.

In travelling, a climb was made to the top of a high table land about three miles from the sea and at an altitude of 1,750 feet. The formation here was similar to that of Salmon river.

A remarkable discovery was made of some trees that had been buried in the soil; the butts were in a perfect state of preservation; the trees were lying in a line due east and west parallel with each other, resting on a bed of twigs similar to those seen in lower latitudes.

It was believed by Mr. Janes that excavations for several miles along this table land would result in finding a large number of buried trees in a good state of preservation. Some buds were also dug up from the soil, and the whole discovery was of a most striking and remarkable character. Samples of the wood and buds were carried away, as they were most convincing proofs that the climate at one time had been of such a character as to permit trees to grow.

Another remarkable discovery of coal was made at Canada point. The seam appeared to be very extensive. The face of the country consisted of small hillocks, and along these hillocks for a considerable distance there appeared to be the same evidences of coal as shown near the seam.

Mr. Janes arrived back at his station in Ponds inlet on the 14th of June and tested the coal by burning it in a small stove, and found it to be similar in quality to the coal at Salmon river.

A report was also made on a trip from a point opposite Albert harbour to the S.W. end of Bylot island with the intention of prospecting for minerals. Some specimens of a mineral supposed to be antimony were found, also indications of coal in a number of places. No excavations were made, however, deeper than a couple of feet, as the soil was frozen to a great depth.

A report was also made to the commander of the vessel respecting a visit to cape Bowen in May, and some prospecting was done, but not of a sufficient kind, owing to the depth of the snow. The snow was so deep that it was almost impossible to travel.

A trip was also made with natives, fifteen dogs, and provisions for ten days to Canada point and Bylot island, but as the intention was to go to Possession bay, much time could not be taken up in this trip to Canada point.

The snow had left the land on the higher parts, but the low lands were so wet that it was impossible to do anything in the way of prospecting except in the higher lands.

Here an important discovery was made of a seam of coal 1,650 feet above the sea level. The seam was found to be 14 inches in thickness, dipping at an angle of 45 degrees to the eastward. A bag of coal was secured and taken back to the camp.

A position was taken up on Bathurst point, but the ice was so heavy around the coast that no vessels could make their way about this part of the island. While watching for vessels, a large whale was seen at the edge of the floe N.E. of the cape. Mr. Janes returned to Button point on the 28th of June, not having seen any of the whaling vessels.

Another visit was made to Button point in July for the purpose of watching for the arrival of whaling ships. The ice had been so heavy around the coast that no vessels could approach until the 10th of July, when two ships came in sight to the N.E., which were at once recognized as whaling vessels. These vessels made fast to the edge of an ice floe and Mr. Janes, therefore, made his way over the ice floe to board the vessels.

The names of the vessels were the S.S. "Morning," Captain Adams, and the other, the "Diana." The object of boarding vessels was to issue whaling licenses. The "Diana," however, left the place where she was anchored before Mr. Janes could board her. Captain Adams of the "Morning" stated that he had left Dundee on the 15th of April and had a fairly good run up as far as Disco island; from there northward the ice was heavy and the experience was the worst that



Arctic Caleche, June 23rd, 1911.

Capt. Adams had ever known in sailing to these waters. There had been a succession of S.W. gales followed at times by S.E. light winds which kept the Arctic ice close on the Greenland side, the course usually taken in going north. The "Morning" was beset by ice for twenty-one days, having narrowly escaped on several occasions from being crushed by the heavy ice.

The "Diana" it appears was also in the same danger of being crushed as the "Morning." The boats of these steamers had been made ready for leaving the vessels more than once. The captain reported that he had not seen any whales. Capt. Adams had brought mail for the "Arctic" with him.

With regard to issuing the license, the captain stated that it would be necessary for the Department of Marine and Fisheries to communicate with the owners of the vessel, living in Dundee.

The "Morning" was at the time outside of the three mile limit and Mr. Janes could, therefore, do nothing further and left for Button point.

The intention of the captain of the "Morning" was to proceed to Jones sound, very much further north than Bylot island, perhaps for the purpose of doing some trading with the natives, according to the practice of the whalers in the past years. This, however, is only assumed by Mr. Janes.

The "Diana," on the 12th of July, made fast to the edge of an ice floe about 10 miles east of Button point. She was boarded and the request made to the captain to take out a license for fishing for whales in Canadian waters, but he stated that he had no money, that the company by which the vessel had been sent out would pay for the license if insisted upon by the Department of Marine and Fisheries.

Mr. Janes was, therefore, unsuccessful with regard to issuing licenses.

The "Diana," it was stated by her captain, would also go to Jones Sound.

Mr. Janes then made his way to Albert harbour and then to the station at Ponds inlet.

After returning from the visit to the whalers on July 11th, a trip was made to Salmon river by boat. The whole of Eclipse sound and Ponds inlet westward from the station, was then open water as far as could be seen. Salmon river was also open and salmon were found in it in abundance. Accompanying Mr. Janes

were five natives. A considerable quantity of salmon was secured for use on board the ship "Arctic" upon her arrival at Ponds inlet. Twenty-one bags of coal were also secured and taken to a point in Eclipse sound, about $4\frac{1}{2}$ miles from the mouth of the river.

APPENDIX No. 7.

OFFICIAL REPORT OF THE DEPARTMENT OF MINES ON ANALYSIS AND TEST OF ROCK, COAL, SHALE, AND MINERAL SPECIMENS SECURED DURING THE CRUISE OF THE
"ARCTIC" IN NORTHERN REGIONS, 1910-11.

Department of Mines, Ottawa,
January 4th, 1912.

Memorandum:—

Re specimens collected by Captain Bernier on his latest voyage to the far North, at or near the undermentioned points.

I. ARCTIC BAY:

1. Compact argillaceous shale—said to exist in large quantities. Yields no oil on distillation.
2. Weathered and rust-stained dolomite, carrying a somewhat large quantity of copper pyrites.
3. Trap rock—of no commercial value.
4. Greenish-white quartz rock, carrying a small quantity of pyrite.
5. An association of limonite and quartz together, with small quantities of copper pyrites and of iron pyrites.
6. Magnetite, with a large proportion of quartzose, gangue metallic iron content.....36.00 per cent.
7. Weathered and rust-stained dolomite, carrying a very small quantity of copper pyrites.

A second specimen from the same locality consisted of an association of dolomite and quartz, through which is distributed a small quantity of magnetite.

8. The following rock and mineral fragments—
 - a. hornblende-gneiss.
 - b. limonite—contains a very little insoluble mineral.
 - c. iron pyrites.
 - d. chert.
 - e. slightly argillaceous and slightly calcareous quartz schist.

From a point five miles from Arctic bay—direction not stated—

9. Limonite, carrying a small quantity of siliceous gangue. The specimen is slightly stained with green carbonate of copper.

From the north-west part of Arctic bay—

10. Dolomite, carrying a few minute crystals of magnetite.

From the north-east part of Arctic bay—

11. An association of quartz and hematite—of the two minerals, which are arranged in paralleled bands, the quartz constitutes much the larger portion of the specimen.

12. An association of trap rock and quartz, carrying a few particles of specular iron. The specimens are all slightly weathered and stained in parts with green carbonate of copper.

13. a. Trap rock, of no special economic worth.
b. Several fragments of quartz, carrying small quantities of chalcopyrite.
14. Conglomerate rock, carrying a very small quantity of specular iron.

II. ADAMS SOUND:

15. An association of vesuvianite and quartz.
16. An association of prehnite and quartz.
17. Slightly argillaceous, dolomitic limestone, carrying a small quantity of disseminated iron pyrites.
18. Trap rock, carrying a few scattered particles of specular iron and of iron pyrites.
19. Muscovite—more or less shattered.
20. Iron pyrites—assays showed it to contain:

Gold.....	trace.
Platinum.....	0.32 of an ounce to the ton of 2,000 lbs.
21. So called "nickel ore"—sandstone carrying a small quantity of disseminated iron pyrites. Specimen is slightly weathered and rust stained, and is non-nickelliferous.

III. BAFFIN ISLAND:

22. Shaly lignite—ash content 4 per cent.

IV. BANKS ISLAND:

23. A box of small fragments of:
 - a. sandstone, slightly calcareous and slightly ferruginous.
 - b. clay ironstone, associated with quartz.
 - c. quartzite.
 - d. hornblende granite.
 - e. calcite.
 - f. dolomite.
 - g. limonite, with a very small quantity of iron pyrites.
 - h. lignite (?)—ash content 59 per cent.

V. BATHURST ISLAND:

24. Hotspur point—bituminous shale.
 Yields on analysis:—Oil, 140 imperial gallons to 1 ton of 2,240 lbs.; Ammonium Sulphate, 64 lbs. to 1 ton of 2,240 lbs.

VI. BLACKLEAD ISLAND:

25. Disseminated graphite, in quartz rock.

VII. BYLOT ISLAND:

26. Lignite, from a 3-ft. seam, ash content 8 per cent.
27. From Eclipse Sound.—
 Magnetite iron ore— contains a small quantity of insoluble mineral matter
 Deposit said to be an extensive one.
28. From near Cameron Point:
 Lignite—ash content 5.00 per cent.
29. Hematite—a single nodule picked up on the beach.

VIII. GEORGE V. MOUNTAIN:

30. Red sandstone.

IX. IGOLICK:

31. Dolomite.

IXa. JOHNSTON HARBOUR:

Magnetite in a quartzose gangue.

X. MELVILLE ISLAND:

From the winter anchorage of 1909.

32. Clay ironstone—contains a small quantity of insoluble mineral matter. From a point one mile west of the anchorage:
 33. Hematite—contains a large proportion of insoluble siliceous gangue.

XI. MOFFETT BAY:

From Richard Island:

34. Mica—variety muscovite—specimen much shattered and of little worth. From the bottom of the bay:
 35. A nodule of limonite.

XII. NANTILICK:

36. Several specimens of mica—all much shattered.
 37. Tourmaline.

XIII. PONDS BAY:

38. Iron pyrites.

XIV. STRATHCONA SOUND:

39. So-called "silver ore"—an association of calcite and breithauptite (nickel antimonide), carrying native silver. The specimen which weighed but one ounce was rich in silver, but on account of its diminutiveness was not assayed.

40. Quartz conglomerate, carrying a very little specular iron.

41. Hematite—contains but a trifling quantity of insoluble mineral matter.

42. An association in varying proportions, of iron pyrites and quartz. The main vein has a width of 40 feet and has been traced for several miles.

Assays showed it to contain:

Gold.....none.

Platinum.....0.11 of an ounce to the ton of 2,000 lbs.

XV. VICTOR BAY:

43. Weathered conglomerate rock, not mineralized.

44. Calcareous argillite.

45. Crypto crystalline quartz.

46. Quartz, carrying a small quantity of disseminated iron pyrites. Specimen slightly weathered and rust-stained.

47. Quartz—vug.

F. G. WAIT,
Chemist.

CANADA GEOLOGICAL SURVEY.

VICTORIA MEMORIAL MUSEUM.

BULLETIN No. 1.

XII.—*Prehnite from Adams Sound; Admiralty Inlet, Baffin Island, Franklin.*

BY ROBT. A. A. JOHNSTON.

The material which furnished the subject of this article was collected by Mr. Arthur English while engaged as prospector on the expedition of 1910-1911 of the Canadian Government steamer Arctic under the direction of Captain J. E. Bernier. The locality is given as near the head of Adams sound, which would make its position as about 73° 12' north latitude and 82° 30' west longitude. And from information gained from a letter written by Mr. English to Dr. A. P. Low, Deputy Minister of Mines, in which he gives a summary of his observations upon the geological features of the country, it would appear that near the head of the

sound extensive beds of shale are exposed. These shales are impregnated to a greater or less extent with iron pyrites and copper pyrites; the pyritous minerals occur in the form of flattened nodular concretions and thin scales and are particularly abundant along the contact with gabbroid intrusives by which the shales are extensively invaded; these intrusives often take the form of dykes of large proportions, ranging from 1 foot to 30 feet or 40 feet in width. In the neighborhood of these intrusives the strata are traversed by numbers of vertical veins of quartz and calcite, in which galena and pyrite and even fine particles of native gold have sometimes been observed. And it is presumably from one of these quartz-calcite veins that the mineral under consideration has been obtained.

The specimens as received by the writer are two in number and are excellent examples of vein formation. They present a nearly uniform thickness of two inches, and in one of the specimens there is evidence of some contortion. The principal constituents are the quartz and calcite as mentioned by Mr. English, and the prehnite, which forms the chief motive of this article; in addition to these, a very few minute particles of a dark or nearly black mineral have been observed scattered sparsely through the vein; thin sections of the veinstone were examined by Professor Pirsson and Mr. Drysdale, of New Haven, Conn., and this dark mineral was shown by them to be axinite; no other minerals than those mentioned have been observed in these specimens. The most abundant mineral in the vein is a translucent quartz, all but white in colour, there being an almost insensible purplish tinge present. The quartz for the most part takes the form of groups of imperfectly defined crystals radiating from loci midway between the wall and the centre of the vein; the individuals of these groups find, as might be expected, their greatest development towards the inner portions of the vein, and in many cases they terminate at the opposite wall; while, contrariwise, their development has been arrested in early stages of their growth. These groups are thus generally very irregular in their outlines; some show a semi-spherical outline, while others are more or less elongated in one direction and flattened or compressed in a direction normal to it. The calcite and the prehnite, which are approximately equal in amount, fill the interspaces between groups of quartz individuals. The calcite is white in colour and does not present any unusual characters.

THE PREHNITE.

As indicated above, the prehnite seems to be more intimately associated with the calcite than with the quartz. In the hand specimens the prehnite may be observed in small patches and reticulations up to one-fourth of an inch in width; these to the unaided eye, or with a hand lens, appear to be homogeneous; in thin sections, however, they are seen to be contaminated with more or less calcite and some quartz; it has a rather indistinct prismatic cleavage. Prof. Pirsson, who has examined the mineral optically, has furnished the following notes regarding it: birefringence >0.20 ; index of refraction >0.16 ; parallel extinction; optic axial angle positive. The colour is a very pale green; it is perfectly translucent and has a weak, pearly lustre.

In thin sections under the microscope the prehnite is seen in the form of sheaves and bundles of minute crystals mixed with more or less of the calcite and some quartz. Its hardness is about 6. Before the blowpipe it fuses with swelling and contortion at about 3.5 to a brownish slag which is not easily further fused. On strong ignition in a closed tube it yields water. Previous to fusion the finely divided powder is not readily acted upon by strong hydrochloric acid; after fusion it gelatinizes perfectly.

For the purposes of an analysis a number of pieces of the mineral were first freed as far as possible by hand from associated quartz and calcite and then crushed to pass through a sieve of twenty meshes to the linear inch; the crushed material was then treated with dilute hydrochloric acid ($1 \text{ HCl} : 6 \text{ H}_2\text{O}$) to remove calcite;

it was then washed and allowed to dry at the ordinary temperature of the air for twenty-four hours, after which it was introduced into a Penfield's separatory tube charged with Thoulet solution of 2.8 S.G. The heavy separate was after a time removed, washed with KI solution and afterwards with pure distilled water; it was then spread out on glass plates and allowed to dry. As will be seen subsequently, however, this treatment probably did not effect a complete separation of the quartz, as the analysis shows an excess of 4.38% of silica over that required for normal prehnite. Its specific gravity at 15.5°C. was found to be 2.924, and an analysis of the material prepared as indicated above gave the following figures:—

Silica (SiO_2).....	44.35
Alumina (Al_2O_3).....	19.44
Ferric oxide (Fe_2O_3).....	6.58
Calcium monoxide (CaO).....	25.50
Water (H_2O).....	4.00
	99.87

Chlorine and fluorin were sought quantitatively by the method of Berzelius, but with negative results in each case.

These figures afford the following molecular ratios:—

SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	H ₂ O
0.739	0.188	0.041	0.454	0.222
	0.229			
0.739			0.454	0.222
3	1		2	1
(+ 0.073).				

The excess of 0.073 in the molecular ratio probably represents admixed quartz which would thus amount to 4.38 per cent. By subtracting this from the total silica and recalculating the remaining constituents the centesimal composition of the mineral is obtained. This is given in column I; the figures in column II are those obtained by Genth (American Philosophical Society, XX, 401, 1882) for another prehnite high in iron from Cornwall, Pennsylvania; these are added for purposes of comparison.

	I.	II.
Silica (SiO_2).....	41.86	42.40
Alumina (Al_2O_3).....	20.36	20.88
Ferric oxide (Fe_2O_3).....	6.89	5.54
Calcium monoxide (CaO).....	26.70	27.02
Water (H_2O).....	4.19	4.01
	100.00	99.85

Owing to its high iron content it has been suggested by Professor Pirsson that this variety of the mineral be called *ferroprehnite*.

APPENDIX NO. 8.

REPORT OF MR. A. ENGLISH, ABRIDGED.

Captain J. E. Bernier.

Commander C. G. S. "Arctic."

Dear Sir,

In submitting the following report to you, I beg you to take into consideration the very meagre opportunity offered me of making any extended exploration or any systematic investigation into the geological structure of the places at which

we called. This plea I offer as my apology for the shortcomings of this report. To be a successful navigator of these uncertain seas, one must be ever ready to move forward when the vagaries of the ice permit a passage for the ship. It would not be in harmony with this state of preparedness to have a man away from the ship for any extended time, so, unfortunately for me, the working out of the problem successfully requires time and painstaking effort. However imperfect this report, it gives me a great deal of pleasure to submit it to you.

Pond's Inlet and Vicinity.

The rocks here are so altered and disturbed that they offer a very difficult problem to the geologist. That they have undergone great alteration is plainly evidenced. Those basalts bore a great share in the process of alteration. The hills rise abruptly from the shore. The talus is very rough and composed mostly of large boulders. The frosts of winter are rapidly tearing down these mountains and reducing them to dust. Possession bay, Bylot island, was visited for a few hours. I had not time to examine the rocks at this place. From the presence of scattered pieces of red hematite that I found on the surface of the valley, I should judge the place worthy of extended investigation; I have no doubt of a mineralized zone. I submit a small sample of the hematite to you with this report.

Erebus Bay.

Landed on Beechy island but crossed at once to North Devon. Both those islands seem to be composed of like material. North Devon, at the part visited by me, is composed of limestone of the upper silurian system. I found fossils. I found some small pieces of red sandstone, but not sufficient to obtain any deduction.



Entrance Erebus Bay, Beechy Island, Cape Spencer.

The strata are horizontal; a slight dip is noticeable in one or two places, in one case forming a long cyclinal fold. The stones are shaly and have a decided clink when one passes over the fragments. The mountain tops are level and afford good walk-

ing; no boulders obstruct the way. Vegetation is very scant even in the valleys. I found lines of ancient sea beach high up the flanks of the mountains, at 300 feet above the sea. I found a large piece of whalebone lying on a bed of clam shells;



Cache No. 2. Remains of Northumberland House, Erebus Bay, August 19th, 1911.

each trace shows those lines of white shells of bivalves. It would appear from the vertical distance which separates the higher terraces, that at first the land rose quite quickly; later the emergence was carried on more slowly as the lines of beach occur at closer intervals.

A. ENGLISH,
Prospector.

Captain J. E. Bernier.
Commander C. G. S. "Arctic."

Dear Sir,

I beg herein to submit to you a report of my investigations at the head of Adams sound. Spent ten days at the above-named place, prospected the district within a radius of four or five miles of the camp where practicable. I also explored the deep valley which extends from the water of the sound to a distance of nine or ten miles in an easterly direction.

At the time of my visit to the place, much snow encumbered the ground, making the work of prospecting very difficult and unsatisfactory; indeed I could only examine the walls and slopes of the canyon and ravine in a few places.

Yours truly,

A. ENGLISH.
Prospector.

Report on Prospecting on Adams Sound.

Together with a party of hunters I left the ship on Friday morning, September 16th. We encamped that evening near the mouth of a small river about 20 miles

from Arctic bay. I took advantage of our two weeks' stay at that point and investigated the geological aspect of the regions within a few miles of camp in all directions. I made a collection of mineral specimens, but unfortunately had to abandon it in order to lighten our sled boat which would break through the thin ice. The collection may be recovered as soon as ice permits. On account of not having these specimens I am unable to assign the rocks to any particular geological period. The regions have undergone considerable alteration. No fossil evidence remains as far as I can at present state.

At the sea shore gneiss protrudes. Garnets abound in some of those rocks where alteration has not been so great. Those basal rocks present rounded contours. Those rocks have been smoothed, polished, and striated, giving evidence of past glacial action. Above those basal rocks rise masses of dark close grained rocks, and above these tower immense sandstone cliffs. Trap dykes traverse the country, having a general east and west trend. The strata are inclined about 20°, dipping northeast or nearly so.

A. ENGLISH,

Prospector.

October 4th, 1910.

Mineral Samples collected by Arthur English, Baffin Land, 1910.

1 to 9, canyon N. side head Adams sound, Friday, October 7th; 10 to 11, ravine S. side of sound near head, Saturday, October 8th; 12, Boss (in contact with basic sedimentary), Adams sound, E. side Johnston Hr. Rocks, October 27th; 13, Adams sound, N. side Johnston Hr., October 29th.

Besides above enumerated, box also contains samples collected in Victor bay and vicinity. Box No. 11.

Arctic bay, Baffin island, November 15th, 1910.

Arctic bay, Baffin Island,

May 25th, 1911.

Captain J. E. Bernier,

Commander, C. G. S. Arctic.

Dear Sir :—

I have the honour to submit to you a report of my prospecting in Strathecona sound. In obedience to your instructions of May 1st, I set out on that date for the above mentioned place about 9 o'clock a.m., and made camp at the mouth of a deep ravine on the N. E. side of the bay at 3 o'clock the same afternoon. I had as assistants Messrs. Chasse and Montford.

After having made camp and had luncheon, the men went over the hills to look for game for our larder, whilst I examined the rocks in the neighbourhood. I found here no indications of metallic ores. Whilst looking over the rocks I found a slab of sandstone erected after the manner of a gravestone. It stands on a grassy slope above the sea, it measured three feet in height, by one foot wide, by two inches in thickness. It is almost perfectly rectangular in form. It bore no inscription of any sort, and was evidently erected by previous explorers as a landmark.

Next day, the 2nd, I made an attempt to visit Elwin bay, but failed, partly on account of bad, rough ice, which made sledding very difficult, and partly on account of a snowstorm. As my time was limited, and as the principal part of my work lay in Strathecona sound, I did not make a second attempt, but on the following day removed our camp about eight miles farther in the sound. This camp is called camp 2. At this point the eskimo left us and returned to the ship. Here we remained until Friday, May the 5th.

In the ravines here are salt-encrusted rocks, the salt being no doubt derived from the evaporation of the water from saline springs. Such evidence of salt I found pretty constant on both sides of the sound. On Friday, May the 5th, we again removed to a point about eight miles towards the head of the sound, our object being (as expeditiously as possible) to reach the extreme end of the bay ; seeing within three or four miles of us what we took for the end, we erected a cairn about one mile south-east of our camp, and therein placed the box containing a record according to your instructions. Part of two days were spent in this work, rocks being hard to obtain. We photographed the cairn when completed. It measures 22 feet in girth near the base and 18 feet over the top from side to side. The box holding the record we placed in the centre, about two feet from the top. The pile is built of sandstone, mostly flat, flag-like, and rests on a limestone base. The head of this bay is what we had taken for the end of the sound. On Tuesday, the 9th, we removed to S.W. side of the sound, and made camp 4 at the mouth of a deep, narrow ravine. Thursday, the 11th, we again shifted camp to a spot about three miles to the N.W. We found sled hauling very toilsome on account of deep snow and a defect in the sled. Whilst at camp 5 we had a visit from the chief officer, Mr. Morin, and a couple of days later a visit, at an early hour in the morning, from the commander and engineer, Mr. Koenig. After a hasty breakfast we left for a visit to the canyon. After having shown our visitors over the prospects, I returned again to camp, and with the assistance of Mr. Montford and the Eskimo Cacto and a few dogs, shifted two or three miles still further to the N.W. Here our visitors passed the night with us, enjoying a well-earned rest, having been steadily on the go nearly two whole days and nights. On Monday morning, May 22nd, we finally broke camp and returned to the ship, arriving here at 9 p.m., very tired after a long tramp through deep snow. Before concluding, I wish to thank you for the compliment you bestowed upon me, by naming after me the small bay or harbour discovered by us in this sound.

Yours very truly,

ARTHUR ENGLISH.

C. G. S. "Arctic,"

Arctic Bay, July 18th, 1911.

Captain J. E. Bernier,

Commander C. G. S. Arctic.

Dear Sir,

I have the honor to lay before you the following additional information in regard to my discovery in Strathcona sound. I regret that I am unable to afford any valuable data from which reliable figures may be taken as to expenses of mining, shipping, etc.

As a prospector I can, however, assert with some authority, that a very large body of ore exists in that locality, and under ordinary conditions, or were the deposit located in more favorable latitudes, mining operations could be carried on with a certain profit to investors. Of course, this is assuming that the mineral is valuable; an assay only can determine this.

I remain,

Yours truly,

A. ENGLISH.

C. G. S. "Arctic,"

Port Burwell, Sept. 7th, 1911.

Captain J. E. Bernier,

Commander C. G. S. "Arctic."

Dear Sir,

I have the honour to submit to you the subjoined short report of my investigation in the neighborhood of Blacklead, Cumberland sound, Baffin island.

The brook occupies what appears to be a line of fault running about north and south. Saw an old mica prospect that has been abandoned, the deposit not being sufficiently valuable to be worked at a profit. The mica is developed in platy aggregates in veins having a generally north and south strike. Small veins of graphite are also found in the same rocks. I saw a great many small stringers and one about a foot in width. This wider one is not so pure as the others, the small one being almost pure graphite. I believe the rocks themselves graphitic to a considerable extent, particularly in the neighborhood of this vein.

I have the honour to be, Sir,

Yours truly,

A. ENGLISH,

Prospector.

APPENDIX No. 9.

Arctic bay,

December 3rd, 1910.

Captain J. E. Bernier,

Commander C. G. S. "Arctic."

Dear Sir,

At your request I beg to submit my report of the expedition on which I accompanied Mr. E. Lavoie, C.E. Your verbal instruction to me was to help Mr. Lavoie to take observations and survey the coast along cape Hallowell, and, incidentally, report on the geological formation of the places visited. Before proceeding further I will take the liberty of stating that I was unable to do justice to the country owing to the ground being covered with snow and having to travel with much speed so as to get to our destination. I will, however, do my best to do so. We left Arctic bay on the 12th of October, returning on the 17th of November, having been away 36 days, covering over 550 miles.

I find that to a point about 75 miles on the southeast coast of Admiralty inlet the formation is the same as in Arctic bay, viz: silurian and cambria-silurian.

I must say that this formation is a very constant one all along the coast except at No. 1 island, quartz appearing very fairly distributed through said island, being a quartz proper. As I proceeded along about five miles southeast of said island, I came on a contact between granite and gneiss, where there is a very strong deposit of black mica, in red feldspar mixed with white flint giving indication that muscovite will probably be found if properly prospected. This deposit is over one mile and a half wide running east and west.

We then proceeded to a place called Assilook. I noticed that the upper stratas had been worn down so much that they disappear completely to give place to granite which is constant as far as we went, only that they also disappear being covered with gravel and sand to the end of our journey. The country there resembles a rolling prairie. We saw a lake named Lapontigne; the river

discharging from said lake runs through a bed of sand. We then portaged over a small lake and found two large lakes which are named Tacil; they empty into White inlet. We then went to Agoo at the botton of Autridge bay, situated about the mouth of Ikalo river. We then surveyed the coast and built a cairn about 15 miles northwest of Agoo. I must also report that there is evidently very little pressure there as the layers of sand and gravel are not much disturbed. The elevation is not above 30 feet at high tide, it is simply, as stated above, a rolling prairie. I will close this report by assuring you that I have faithfully followed your instruction re Mr. Lavoie.

I must also bring to your notice the native Coodno, as he is a man of no small value, having proved himself more than useful. Thanking you, Commander J. E. Bernier, for the good advice given me and hoping that this will meet with your approval,

I remain, respectfully,

J. E. MATHE,

Prospector.

Arctic bay,

June 12th, 1911.

Captain J. E. Bernier,

Commander C. G. S. "Arctic."

Dear Sir,

I have examined the iron deposit situated between Arctic and Victor bays, the one you and I went over on the 6th inst. My observation is that the ore is of good quality (non magnetic). The outcrop of the vein is 150 feet wide in a fissure of limestone, lower silurian. The ore is broken up, also the west wall. I have traced the vein well up into the gorge of the mountain, south of Victor bay. The direction of the vein is northeast to southwest.

Facing north there is too much drift rock over said deposit to permit me to trace it up any distance. The samples you collected on the first visit are identical with the ones found north and south of where you made small cairns. They show the same quartz. It was impossible for me to secure bigger samples, for, as stated above, the ore is all broken up but well distributed through the vein. To my best estimation the ore carries about 35% of iron.

Hoping this will meet with your approval,

Yours respectfully,

J. E. MATHE,

Prospector.

APPENDIX No. 10.

C. G. S. "Arctic,"

Arctic bay, 20th April, 1911.

To Commander J. E. Bernier,

C. G. S. "Arctic."

Sir,

I beg to report that, according to your instructions, I have been at Crauford and erected a cairn on the point, with the help of the Eskimos that I went

with, on the 16th March, 1911. I left in it the record that you gave me, and I placed the cairn on the most northern part of the point on an elevation of about 60 feet, so that it can be seen from the north and from the south.

I noticed a reef off the point in the N.E. direction, and I also noticed two large icebergs aground on the same line of bearing, about 3 miles off.

I made two long excursions while there. I went about 20 miles west of Crauford and found the cliff perpendicular from the indentation ; the cliffs are a good deal weathered by time ; I also went to the eastward of cape Chas. York and found there the accumulation on a shoal off the cape. I also observed that the Lancaster sound ice is moving with the prevailing wind and the general discharge is towards the eastward ; the ice moves with the flow and ebb. The stationary ice is about 5 feet thick, and is broken from the icebergs to cape Chas. York. I noticed a place which indicates shoal water, about 12 miles south off cape Crauford, near the shore.

I also noticed that the ice is very strong and level. During a storm on the 16th April, 1911, the ice went off the coast and came back again. I saw some bears but did not kill any. I also saw some tracks of foxes, and there are a large number of seals in the open waters. Hoping this report will meet with your approval.

Yours very truly,

ALFRED TREMBLAY.

APPENDIX No. 11.

Memo of distances travelled by officers and other parties during our stay in Arctic bay, on foot and with dog sledges.

1. Voyage of J. E. Lavoie to cape Hallowell Cairn and return, 694 miles.	} 1511 miles	
2. Voyage of J. E. Lavoie to Bowen bay and return by cape Hallowell, 817 miles.		
3. Voyage of O. J. Morin to Shimming bay and return.....	240	"
4. Voyage of 2nd Officer R. S. Janes to Adams sound prospecting....	60	"
5. Voyage of Arthur English to Adams sound prospecting, 150 miles.....	} 420	"
6. Voyage of Arthur English to Stratheona sound prospecting and return, 270 miles.....		
7. Voyage of Capt. Bernier twice to head of Adams sound, and to head of Stratheona sound, inland trips, different times around the peninsula, Marcell lake, and King George peak, 235 miles	} 259	"
8. Around the peninsula by Capt. Bernier, 24 miles.....		
9. Mr. Mathé prospecting to cape Hallowell and return, 347 miles..	} 527	"
10. Trips of Mathé and Omming to Moffet bay and return, 180 miles		
11. Inland, A. English prospecting with two others, Chasse and Montfort, 80 miles.....	80	"

12.	Trips of different members looking for mineral.....			70	miles
13.	R. S. Janes trip to Ponds inlet, 180 miles.....	}	800	"	
14.	" " " Coutts inlet, 175 miles, return.....				
15.	" " " Possession bay, 160 miles.....				
16.	" " " Canada point, prospecting, 150 miles.....				
17.	" " " Salmon lake, prospecting, 75 miles.....				
18.	" " " Button, outside 60 miles.....				
19.	Trip of A. Tremblay to cape Crauford, return.....			84	"
20.	R. S. Janes voyage to Adams sound and return.....			60	"
21.	Trip of launch from Albert harbour to head of Milne inlet and Philips cove			230	"
				4341 miles.	

J. E. BERNIER

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